2020 SUPPLEMENT TO THE CANADIAN JOURNAL OF INFECTION CONTROL (Volume 35, Number 1, Spring 2020)

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The following abstracts were accepted by the 2020 Scientific Program Committee, Abstracts Sub-Committee. Because the 2020 conference was cancelled, these abstracts were not presented.

MOVING KNOWLEDGE TO ACTION: HOW CAN WE OPTIMALLY SUPPORT DIFFERENT HEALTHCARE SETTINGS TO REACH THEIR IPAC GOALS?

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Issue: The Infection Prevention and Control (IPAC) department at Public Health Ontario (PHO) provides support to health care settings to enable consistent adoption of best practices in infection prevention and control (IPAC). The IPAC Regional Support unit plays a role in dissemination, knowledge exchange, and capacity building. To effectively prioritize the supports we provide it is essential that we understand the needs of our stakeholders.

Project: A needs assessment was conducted involving IPAC professionals in all healthcare sectors in Public Health Ontario's Central West region. The project was framed by the Knowledge to Action Cycle to support a full exploration of practice gaps, priorities, barriers and facilitators, and strategies. The objectives of the needs assessment were to: 1. Identify practices that are most in need of improvement; 2. Describe barriers influencing practice change; 3. Gather information on gaps in knowledge and skills, and 4. Describe how stakeholders currently receive support and their preferences for future supports. Multiple data sources were used to collect information from infection prevention and control professionals stakeholders in public health, primary care, dental, hospital, long-term care home, retirement homes, first responder, and home care organizations from April 1 to June 30, 2019. These data sources included: an online survey, interviews with public health units, inquiries captured in PHO's Stakeholder Relations Management database, and results of previous evaluations of educational sessions delivered by PHO from April 1, 2017, to March 31, 2019.

Results: Information was collected from eighteen Public Health Unit representatives and there were 135 responses to the survey, with 56% of respondents being from long-term care and retirement homes. The needs assessment identified the importance of tailoring supports by sector. A list of priority IPAC practice areas was generated for each sector, as well as the preferred modalities for receiving training and information. Across all sectors, stakeholders primarily face barriers to practice improvement that are related to the physical environment and resources (17%), and motivation-related barriers (beliefs) (40%). There was also a strong interest in further skill development around techniques to motivate and inspire colleagues and to secure buy-in.

Lesson Learned: The needs assessment was supported by multiple data sources. The survey gathered comprehensive information about specific barriers that contribute to challenges in improving IPAC practices that could be applied beyond our region. The needs assessment has provided information that will be used to prioritize areas of focus for group activities that help stakeholders identify and focus on specific practice gaps in these areas, specific barriers to change and exploration of strategies to guide improvements.

UGANDAN MEDICAL INTERNS INFECTION CONTROL KNOWLEDGE AND PRACTICES

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Issue: An assessment of the level of knowledge, attitudes, and practices of interning graduates of clinical medicine who were attached to government hospital in, central districts of Uganda.

Project: This was a cross-sectional survey responded to by 217 (response rate of 70%) new graduates who were about to start their internships in August 2018 in different central Ugandan hospitals. questionnaires with knowledge, attitude, and practices questions were distributed to the participants during a two-day internship orientation organized by the national internship committee.

Results: Out of 310 subjects approached, the survey was completed and returned by 217 (70%). More nurses (55.4%) failed the questions on odds of HIV transmission after a needle stick injury compared to 26.0% and 36.4% of medical and dental graduates, respectively ($x^2 = 24.06$ $p = 0.001$). There was no difference in proportions of those who re-sheath needles. Respondents who had an encounter with positive tuberculosis history when taking clinical notes while unprotected were not more motivated to use masks ($x^2 = 8.06$; $p = 0.06$). Nurses and dentists reported more regular hand washing before and after patient contact compared to medical doctors.

Lessons Learned: Overall, the knowledge of infection control was not reassuring and the attitudes and practices appeared to be heavily influenced by the lack of emphasis on standard operating procedures in training hospitals visited as well as internship hospitals. There is little doubt that changes will happen given the lack of strict measure that enforce adherence to standard procedures in the area of infection control protocols, in most hospitals visited. A stricter approach to infection control must be made emphasized mainly in teaching hospitals to encourage students better understand the ever increasing need to control the spread of infection in hospital environments.

EVALUATION OF THE IMPLEMENTATION OF A SURVEILLANCE TOOLKIT IN LONG-TERM CARE

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Issue: Establishing a standardized and validated surveillance system in long-term care (LTC) is an important strategy to reduce health care-associated infections, analyze infection trends over time and to be compliant with legislative requirements.

Project: A surveillance toolkit was developed by Public Health Ontario and implemented in an LTC home corporation. All of the tools were developed based on current best practices consistent with the Provincial Infectious Diseases Advisory Committee, IPAC-Canada and the CDC National Healthcare Safety Network. The objective was to perform an evaluation to determine the facilitators, barriers and preferences related to the implementation of the surveillance toolkit by gathering and analyzing feedback from the participants. A variety of evaluation strategies were used including informal discussions through regular webinars, formal telephone and in-person interviews and online surveys. All participants, including the corporate infection control professional (ICP), the health informatics coordinator (HIC), the ICP designates from each home and front-line nurses were invited to participate in the evaluation.

Results: A total of 66.6% (12/18) of the ICP designates participated in telephone surveys. In-person interviews were conducted for the corporate ICP and the health informatics coordinator. Nursing staff from only 22.2% (4/18) LTC homes participated in the online survey. The majority of the ICP designates felt they were adequately trained (83%; 10/12), supported (83%; 10/12) and prepared (100%; 12/12) to implement the toolkit but preferred in-person training sessions over webinars. Although they didn't use all of the tools consistently, they felt the toolkit improved their surveillance process by increasing the accuracy and consistency of the tracking of infections and analysis of data. The HIC and the corporate ICP identified areas for improvement including the use of more interactive activities during training sessions, the provision of training to front-line nurses and more involvement of IPAC advisory committees and leadership. They both also identified heavy workloads, technical challenges and insufficient resources as a barrier to implementation.

Lesson Learned: Learnings from this initiative will be used to inform the planning and implementation of future projects. Future planning stages will focus on ensuring adequate time is provided to accommodate unexpected delays and challenges, identifying competing priorities early to be able to create and implement a strategy to maintain momentum, and strengthening communication especially in the event of role changes. In the future, opportunities for more in-person training sessions will be reviewed and the tool will be revised and assessed for simplicity and user-friendliness, to ensure comprehension and usability isn't a barrier to implementation.

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DISCONTINUING ARO SCREENING IN MENTAL HEALTH SETTINGS: A CHANGE MANAGEMENT PROJECT

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Issue: Screening patients on admission to mental health units for antibiotic resistant organisms (ARO) is problematic. Patients may not have the capacity to answer risk assessment questions accurately on admission. Staff may not be able to safely collected specimens within the first 24 hours, as required by the Alberta Health Services (AHS) protocol. Collection delays can lead to poor quality surveillance data because it is not clear if the patient had an ARO on arrival or acquired it after admission. Further, in 2018 AHS refocused transmission prevention efforts on routine practices and moved away from contact precautions for most ARO positive patients on mental health units. This change makes the value of continuing ARO admission screening questionable. However, cessation of ARO screening must be carefully considered because practice changes can be difficult to implement and sustain.
Project: The Prosci Change Management process and tools were used to support Infection Control Professionals (ICP) and unit staff on AHS mental health units in Central Zone to prepare for, implement and sustain discontinuation of ARO admission screening. Face-to-face and teleconference meetings were organized with staff. The purpose was to engage staff and explain what was going to change and why, identify strategies to successfully implement change on each unit, establish mitigation strategies for predictable barriers, and to celebrate successes. Local clinical educators were recruited to assist with implementation and reinforcement going forward.
Results: There was a 94% reduction in methicillin resistant Staphylococcus aureus screening swabs sent to the lab from mental health units and a corresponding $21,360 reduction in annual lab processing costs. There was an annual savings of $5,400 for the infection control program because of a reduction in time spent to educate staff on use of the screening tool and audit compliance. A qualitative analysis of staff experiences revealed staff had a positive experience with the change including before, during and after implementation. Leadership appreciated the use of statistical data to demonstrate the need for change and the positive impact the change had on the organization.
Lessons Learned: A structured change management approach helped build awareness and desire for change. Early meetings with staff helped identify concerns about how the change would impact them and ways to successfully implement the change on their unit. Proactive engagement supported staff to take ownership of the change which resulted in reduced resistance and increased adoption. Leaning on unit-based clinical educators, who staff trusted and respected as practice experts to roll out the change, contributed to the project's success. Finally, through a structured change management approach ICPs shifted from their usual role of leading a change to supporting others to lead and own the change.

GYM ROUTINE INFECTION PREVENTION PROGRAM-AN INNOVATIVE, COLLABORATIVE APPROACH TOWARDS EXCELLENCE

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Background: Gym Routine Infection Prevention program (G.R.I.P.)'s purpose was to establish a monitoring program for hand hygiene and equipment disinfection in six Rehabilitation Complex Continuing Care gymnasiums. Our goal was to create a safe environment by preventing acquisition of health care associated infections by promotion of infection prevention and control (IPAC) best practices.
Methods: This project was launched in a facility with 276 inpatients beds including outpatient rehabilitation services. The staff comprised of Physiotherapists, Occupational therapist, Rehabilitation Assistants, Environmental services and Nurses with a focus on hand hygiene, cleaning and disinfecting high touch areas of equipment wiping with the recommended contact time for disinfection. Feedback was gathered from twenty gymnasium staff through in-person interviews and e-mails that included current perception of hand hygiene practices and the idea of using a customized tool to monitor hand hygiene and equipment disinfection in gyms. The audit tool trialed was based on the Just Clean Your Hands (JCYH) program by Public Health Ontario. Feedback gathered from staff elicited modification to better suit the gym environment. The JCYH tool has the first moment involving contact with patient or patient's environment. The modified tool rephrased the first moment as contact with patient and patient's environment equivalent to equipment. Further this tool was classified into two sections: required and recommended practices. Lacking baseline data, our target was to achieve 80% of overall compliance.
Required Moments include: Staff performing hand hygiene before and after patient contact; Staff performing hand hygiene after patient contact; Staff disinfecting equipment before patient use; Staff disinfecting equipment after patient use.
Recommended Moments include: Three additional moments are monitored, but excluded from counts, reason being, they may not always be feasible, like limited mobility of patient's hands; Staff performing hand hygiene on entry and exiting a gym; Staff encourage patients to perform hygiene on entry and exit to the gym; Staff encourage patients to perform hand hygiene before and after activities.
Results: Average three monthly rates from January to September, staff compliance of hand hygiene before patient contact was 76%, 93 %, 80%; after patient contact was 96%, 96%, 96%; equipment disinfection before patient use was 79 %; 79%, 91% and 90%, 97%, 97% after patient use.
Conclusion: This initiative enabled our facility to identify areas for improvement such as reinforcement on education and a plan to sustain higher compliance of hand hygiene and cleaning of equipment. Moving forward, our plan is to collect and evaluate 30-50 observations per gym and result will be shared on a quarterly basis. The intent is to expand this process to outpatient gym as well.

A DESCRIPTIVE ANALYSIS OF IPAC COMPLAINTS, INFRACTIONS AND LAPSES IN PERSONAL SERVICE SETTINGS IN ONTARIO IN 2018

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Background: In Ontario, Public Health Inspectors assess whether or not premises are compliant with infection prevention and control (IPAC) best practices, as outlined in the provincial Guide to IPAC in Personal Service Settings document (2018). Compliance is assessed via annual routine compliance inspections and through additional non-routine (i.e., compliant-driven) demand inspections of personal service settings (PSS). Deviations from IPAC best practice may be further deemed an IPAC lapse if the infraction has the potential to cause an infection in a client. The objective of this study was to understand the prevalence of common PSS infractions by service type (i.e., hair/barbering, aesthetics or body modification) by analyzing the frequency of specific infractions identified during PSS inspections and IPAC lapse investigations in PSS.
Methods: PSS inspection data were obtained from three of 35 geographically diverse public health units (PHU) in Ontario for all PSS inspections and re-inspections conducted in 2018, as well as for all publicly disclosed IPAC lapses in all PHUs in 2018. Data fields included premise type, inspection date and details regarding specific infractions. Descriptive analyses were performed in order to identify specific service types that are commonly associated with infractions as well as those specific practices that are commonly identified to be non-compliant with best practice (e.g., reuse of single use items, inadequate reprocessing of reusable items). Data from routine and non-routine inspections were compared to assess if the same services and practices were routinely identified to be non-compliant.
Results: PSS offering aesthetics were more commonly associated with infractions and with IPAC lapses compared to premises offering hair/barbering or body modification services. Common infractions (regardless of the reason for inspection) included: improper use, storage and/or selection of disinfection products, re-use of items intended to be single-use, and failure to reprocess (clean and disinfect or sterilize) reusable instruments after use. Premises offering aesthetics (and particularly nail services) were the most frequently associated with a complaint due to infection.
Conclusions: Development of infection control resources for specific PSS services, targeted at those practices commonly identified to be non-compliant with infection control best practices, could assist in consistent implementation, awareness and reinforcement of IPAC practices in PSS across Ontario. Ideally will result in fewer infractions being identified on inspection by PHUs. Upstream operator education and infraction prevention could also contribute to a reduction in the number of public complaints received regarding these premises.

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EVALUATION OF AN INFECTION PREVENTION AND CONTROL PATIENT EDUCATION INITIATIVE; THE PATIENT'S PERSPECTIVE

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Objective: Over the last several years, IPAC has been providing education to all patients admitted with a newly diagnosed Antibiotic Resistant Organism (ARO). IPAC conducted a six-month evaluation of this education with patients and families to evaluate the effectiveness of the information being provided.
Methods: Patient education was provided within 72 hours of diagnosis. The evaluation was conducted by administering a post-education patient questionnaire 48 hours following this initial patient education. This evaluation was conducted for a six-month period from May to November 2019. The questionnaire was developed by IPAC with feedback from Patient and Family Advisory Committee.
Results: Over the six-month period 123 patients were identified as eligible for education, 98 of those patients received education on the specific ARO. Of the 98 patients, 34 patients were evaluated using the questionnaire. All of the patients understood why they were on isolation precautions and appreciated speaking to the infection control practitioner. All of the patients received a patient education pamphlet and most of them found it helpful. Patients and families expressed the importance of receiving the information in a timely manner and some requested additional information to be provided both in person as well as in the pamphlet.
Conclusions: ARO education helps patients to understand the reason for being managed on isolation precautions. Discussions with patients provided valuable feedback on how IPAC can improve our processes to better address patient needs. As a result of this evaluation, IPAC will continue to provide patient education in a timely manner for all new ARO patients and we will be reviewing our education pamphlets.

ABSENCE OF TRANSMISSION OF CARBAPENEMASE GENES IN A LONG-TERM CARE FACILITY

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Objective: To evaluate the transmission of carbapenemase genes NDM and OXA-48 in a long-term-care facility (LTCF) after 14 months of routine practices. The status of the index case, colonized with a carbapenemase-producing Enterobacteriaceae (CPE), was originally unknown to the LTCF and thus additional infection prevention and control (IPC) precautions were not implemented.
Methods: Contacts of the index case underwent screening for CPE colonization using rectal swabs collected on days zero, seven, and 21 after the exposure was identified. Swabs were cultured on CHROMagar mSuperCARBA agar (CHROMagar, Paris, France) and Gram-negative, carbapenem-resistant microorganisms were identified to species level using matrix-assisted laser desorption/ionization-time of flight mass spectrometry (MALDI-TOF MS, Bruker Daltonics; Billerica, MA, USA). Phenotypic confirmation of carbapenemase production by Enterobacteriaceae isolates was performed using the Neo-Rapid CARB kit (Rosco Diagnostica; Taastrup, Denmark). Analysis of the index CPE isolate as well as other CPE isolates was performed using whole genome sequencing (WGS) to establish whether the CPE isolates were identical.

Results: Of 19 screened contacts, one was colonized with a CPE. The presence of OXA-48 was discovered by polymerase chain reaction. WGS of the index isolate and the contact isolate revealed the contact to harbour an OXA-181, an OXA-48-like element differing by 4 amino acids but causing a positive PCR result, whereas the index case harboured a true OXA-48 by WGS. This established a lack of relation to the OXA-48 or NDM of the index case. The discovery of the OXA-181 isolate led to another 11 contacts screened for CPE. Among these, CPE was not recovered.
Conclusion: No transmission of NDM and OXA-48 genes occurred among contacts of a CPE-positive index case after 14 months of routine IPC practices in a LTCF.

GOING GREEN TO SAVE THE QUEEN

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Issue: In the spring of 2019 a multidisciplinary team, including members from Site management, Centralized Procurement Supply Management (CPSM), and Infection Prevention and Control (IPC) explored the potential benefits of adjusting the distribution of the most frequently used low level disinfectant (LLD) wipes used at the site. As per past practice, the most commonly used LLD was an ammonium chloride and isopropanol wipe. The hydrogen peroxide wipe offered additional microbial coverage and equipment compatibility while having lower toxicity and cost per wipe than the ammonium chloride and isopropanol counterpart.
Project: A site-wide changeover was scheduled to increase the usage of hydrogen peroxide wipes and decrease the usage of ammonium chloride and isopropanol wipes respectively. As such the warehouse and unit managers were notified of the supply change six weeks in advance. IPC provided education regarding chemical and equipment compatibilities and worked with clinical areas to interpret Manufactures Instructions for Use (MIFU). Clinical areas were encouraged to maintain compliance with CSA standards achieving appropriate levels of disinfection whilst using MIFU approved chemicals (CSA-Z314-18).
Results: As anticipated, the site has seen substantial and cascading benefits from this initiative. A six-month retrospective comparison indicates that since the roll-out the site has seen a reduction of 571 tubs of wipes per month. The total number of wipes used per month has actually increased by approximately 44% due to the smaller size and number of wipes in each hydrogen peroxide tub. This change has resulted $5,071.31 cost savings per month. This extrapolates to annual savings of over 6,800 tubs and $60,855 respectively. Unlike the ammonium chloride and isopropanol wipe, the hydrogen peroxide wipe has a lower toxicity and does not require routine glove use. Therefore, there has been an incidental decrease in glove use. The site is using 44 less boxes (over 11,000 gloves) per month; resulting in a cost savings of $472.56 per month (over $5,670 annually). Other advantages include a decrease in recycling, disposal and plumbing costs. During this time the clinical areas have reported good integration and usage compliance. There have been no adverse events and only a few temporary off-gassing complaints. This analysis does not take into consideration the utilization and cost of the other LLD wipes on site.
Lesson Learned: The success of this project was maximized by stakeholder engagement prior to the implementation; knowing contractual obligations; and site preparation. This result indicates that challenging past practice can be a worthwhile cost savings measure while maintaining compatibility and compliance in cleaning non-critical equipment. With the continual political and cultural movement towards environmentally conscious practice, it is important to have progressive discussions and evaluations regarding chemical usage and the resulting sequela.

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REDUCING INFECTIOUS DISEASE EXPOSURES IN THE EMERGENCY DEPARTMENT THROUGH PROCESS IMPROVEMENT MEASURES IN TRIAGE

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Issue: An effective screening process for infectious diseases is required in the triage area of Emergency Departments so that patients with suspicion for transmissible infections can be promptly placed on additional precautions. Appropriate triaging of patients includes querying them for infective symptoms that help dictate the need for certain types of precautions. Though the triage nurses enter the answers to these questions into the electronic medical record (EMR), the precautions are not automatically initiated. Instead, a printout is generated with an indication to start additional precautions, which are manually entered into the EMR by nursing staff within the department. This step was prone to error and resulted in staff being exposed to various infectious diseases. A process improvement project was undertaken to facilitate triage communication, the initiation of additional precautions, and to minimize infectious exposures. Project: In triage, coloured stickers corresponding to the three types of additional precautions were added to the printout as a stronger visual cue to enter the precautions into EMR. Education was provided during daily unit safety huddles regarding the use of stickers for additional precaution initiation in EMR (with a four-week implementation phase allowing two weeks to disseminate changes). Laboratory confirmed exposures were reported to management using the electronic incident reporting system so that follow up could occur with the involved staff. The exposures were also presented to the department during daily safety huddles. The importance of triage in identifying potential infectious diseases was emphasized during the IPAC module of the educational professional development days. Emerging infectious diseases were also discussed and emphasized the IPAC resources available to triage. The proportions of patients triaged with febrile respiratory illness (FRI) and diarrhea 12 weeks pre- and post-intervention were measured along with the number of incidents reported electronically.

Results: The proportion of isolated patients with FRI and diarrhea increased (51.9% to 61.9% for patients with FRI, and 41.0% to 44.4% for patients with diarrhea). Based on the number of incidents reported, confirmed exposures were further reduced (from 13 to seven incidents seven months pre- and post-intervention).
Lesson Learned: Education efforts in addition to the quality improvement initiatives clarified the triage process in identifying infectious diseases. By discussing common and emerging infectious diseases with the intent to raise awareness of the importance of the triage process, IPAC took a more active role in the department in order to minimize exposures to all infectious diseases within the department. Adding visual cues to enter isolations in the EMR further aided in reducing exposures.

PNEUMOCYSTIS JIROVECII PNEUMONIA IN HEALTHCARE SETTINGS: INVESTIGATIONS ARE RECOMMENDED IF THERE IS A PERCEIVED INCREASE IN CASES AND WHEN THERE IS SUSPICION OF NOSOCOMIAL ACQUISITION

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Background/Objectives: Pneumocystis jirovecii is a fungus implicated in causing pneumonia in immune compromised hosts and is associated with a high mortality rate. Outbreaks of P. jirovecii pneumonia (PJP) have been reported in inpatient and outpatient settings where person-to-person transmission is thought to have occurred. However, the exact mode of transmission, incubation period, and distinction between colonization and infection status makes outbreak investigations challenging. Here, we describe an investigation of a potential PJP outbreak in a solid organ transplant program at a quaternary inpatient setting.
Methods: Once notified by the transplant team of potential increase in PJP cases, the Infection Prevention and Control (IPAC) department conducted chart reviews of each suspected case, which included the admission date, symptom onset and prior inpatient and outpatient visits up to six months preceding this, date of prophylaxis initiation, and test positive date. We investigated for potential epidemiological links with other confirmed PJP cases using temporal and geographic mapping. We also established a baseline number of cases and tests ordered for this organism. Organisms, which were identified using PCR on bronchoalveolar lavage specimens, were genotyped by MLST (CYB, Mt26S and SOD targets sequenced) along with a control case not suspected in the potential outbreak.
Results: Five patients in the liver transplant population (four liver transplant and one pre-transplant) developed PJP within one month and none of the patients had received PJP prophylaxis at the time of symptom onset. The increase in cases was not related to an increase in testing for P. jirovecii based on baseline testing over the past three years. Four cases were genotyped by MLST; one was untypeable and three had mixed genotypes. One case had a mixed genotype comprising of genotypes from two other patients, but no epidemiological links existed between these cases were found (defined as being on the same floor on the same day). Only two instances of potential epidemiological links were found, however, the genotyping did not substantiate transmission.
Conclusion: An increase in PJP cases was found over a period of one month that could not be due to an increase in testing. Epidemiological and molecular data concluded that nosocomial transmission did not occur. This investigation highlights the need to conduct investigations of PJP cases when increased incidence is discovered and that both epidemiological and molecular data are needed to make conclusions regarding transmission. The IPAC program is now line listing cases of PJP and a single potential nosocomial case is considered a sentinel event meriting documenting and investigating.

NORTHERN SASKATCHEWAN FIRST NATIONS HEALTH CENTRES EXPERIENCE: IMPACT OF SUPPORT VISITS ON INFECTION PREVENTION AND CONTROL (IPAC) PRACTICES

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Issue: The incidence of Healthcare-Associated Infections has been increasing gradually over the years in First Nations health centres in Northern Saskatchewan. Compliance with Infection Prevention and Control (IPAC) best practices is recommended to prevent the spread of infections in healthcare settings. Yet, this remains a challenge in many Northern Saskatchewan First Nations health centres. Access to handwashing products, high turnover of staff, concerns about the potential misuse of alcohol-based hand rubs, competing priorities, and limited educational opportunities are factors that contribute to this challenge.
Project: This project started in 2017, and it is ongoing. Before its commencement, the IPAC working group members examined different ways to improve IPAC practices in health centres and nursing stations under the jurisdiction of the Northern Inter-Tribal Health Authority (NITHA). Support visits with an educational session were identified as the most appropriate intervention. To guide these visits, a checklist was developed to assess IPC practices in four major areas, namely; Administrative practices and surveillance, Environment of care, Hand hygiene practices, and Reprocessing of medical equipment. During each visit, the checklist was used to initiate discussion and identify areas for improvement. Each visit concluded with an educational session that was tailored to address the areas for improvement that were identified. After each visit, the IPC Advisor sends feedback of the support visit to the facility's health directors/Nurse managers, and the partner's health director for action on areas that require attention.
Results: The support visits has led to increased hand hygiene compliance rate, adequate knowledge of how to prevent infection in the healthcare settings, enhanced relationships between the IPC program and health services in the communities, change in IPC practices such as switching from the use of non-alcohol based hand rubs to the use of alcohol-based hand rubs in their clinics, increase in the number of consults or request to the IPC program for information or resources, and increased collaboration between the IPC Advisor and the IPC Working group in the partnership. Also, healthcare personnel have adequate knowledge of the component of routine practices. Furthermore, the NITHA infection control manual is now available in most of the health facilities.
Lesson Learned: Face-face communication through support visits is a cost-effective way to prevent and control the spread of infection and also improve IPC practices within existing resource levels. The IPC Advisor will continue to engage the community health centres through the support visit initiative in order to further improve IPAC practices in northern Saskatchewan.

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ASSESSMENT OF MICROBIAL REMOVAL AND RINSABILITY OF NON-ANTIBACTERIAL SOAPS

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Background/Objectives: Hand hygiene (HH) is instrumental for preventing the transmission of pathogens. Handwashing is a frequent HH practice to remove or kill microbes on the skin; both non-antibacterial (NAB) and antibacterial (AB) soaps are acceptable for healthcare use. Studies have shown AB soaps to be more effective than NAB soaps in microbe reduction, however, recent regulatory actions have encouraged the reduction or elimination of AB use. There is a need to understand the formula characteristics that drive microbial removal enabling the development of more effective NAB soaps.

Methods: A commercially available NAB test soap, optimized for microbial removal, was compared to a commercially available NAB reference soap in a series of studies. Interfacial tension (IFT), a measure of the interaction between soap and skin, was measured on the skin to quantify wetting and spreadability. The soaps were evaluated for microbial removal by ASTM E2755. Using Serratia marcescens, 12 volunteers applied 5.0 mL of each soap to dry hands, lathered and rinsed, each for 30 seconds. In a second study, Staphylococcus aureus was used in which 12 volunteers applied 1.8 mL soap to dry hands, lathered for 30 seconds, and rinsed for 10 seconds. To understand the relationship of IFT and rinsability, a blinded, observational study was conducted to quantify rinsability of each soap under different flow rates; 0.50, 0.35, and 0.25 gallons per minute (GPM). Subjects (n=59) participated in the study where 0.9 mL of a soap was used under varying water outputs. Time to complete rinsing of their hands was documented for each subject. Rinsing time (min) and water consumption (gallons (G)) were calculated. Results: The test soap had a significantly lower IFT (1.55 mN/m) compared to the reference soap (2.27 mN/m) ($p=0.01$) indicating improved wetting (i.e. spreading) and coverage of the hands. The test soap removed significantly more microbes for both ASTM E2755 studies. S. marcescens: test soap = 2.26 log10 CFU reduction, reference soap = 1.70 log10 CFU reduction ($p<0.0001$). S. aureus: test soap = 1.46 log10 CFU reduction, reference soap = 1.12 log10 CFU reduction ($p=0.024$). The test soap required less time and water to rinse at all flow rates. The test soap had statistically lower cumulative water consumption across all subjects (11.62 G, reference = 12.52 G, $p = 0.024$) and cumulative time spent rinsing (32.11 min, reference = 34.80 min, $p=0.024$) compared to the reference soap.

Conclusion: Reducing IFT and improving the spreading and coverage of the soap may allow for increased interaction with microbes across the skin's complex topography and better rinsability Formulation of NAB soaps affects microbial removal. NAB soaps can be formulated to remove significantly more microbes than standard, reference soaps the test soap formula rinses faster and uses less water than the standard, reference NAB soap.

SAFE INTRA-FACILITY TRANSPORT OF PATIENTS ON ADDITIONAL PRECAUTIONS

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Issue: Preventing transmission of communicable diseases during patient transportation in hospital requires clear communication, a common understanding of preventive measures among staff and consistent application of these measures. Units sending patients must communicate the need for precautions with transportation staff and the receiving unit. Patients must be prepared prior to transportation in a way that contains pathogens on their person. Staff must employ established infection control measures when interacting with the patient and keep transportation equipment like wheelchairs and stretchers clean. Deficits in understanding and consistently applying these measures were identified at a central Alberta hospital.

Project: Infection Control and Clinical Quality Improvement departments partnered to lead a team of staff from medical and surgical units, outpatient departments, porters and clinical educators to build and employ an effective solution. The Min(imum) Specs Liberating Structures facilitation technique was used to identify what absolutely must be done, and not done, for safe transportation. A focus on cleanliness and hand hygiene were identified. Core elements included: a visual flag on the patient's chart, incorporating a verbal hand off between sending and receiving units and porters, disinfecting the handles of wheelchairs and stretchers, preparing patients with clean hands and clothes and a mask if the patient has a respiratory illness, and staff adherence to the Hand Hygiene Moments. Porters are not required to don gloves, masks or gowns during transportation. These core elements actually align with the original process. Thus, the barrier to safe transport was staff knowledge and consistent implementation of the process. A toolkit was prepared with flow maps, instructional videos, pocket reference cards, and What's In It For Me and FAQ sheets to address common questions. A single process was initially prepared that was later adapted by Emergency and Intensive Care Unit, based on local needs, to improve adoption. Workgroup members, clinical educators and local champions were recruited to teach and reinforce the process on their unit. Porter staff are involved in each patient transfer and tracked process compliance before and after the education intervention.

Results: Compliance with safe transportation practices increased overall by 23%. In a qualitative survey of staff experience, 85% were aware of the process and 87% understood their role in the process.

Lessons Learned: Forging strong interdisciplinary relationships was beneficial to identifying knowledge gaps and developing a set of practice tools for use by all disciplines. Early involvement, active collaboration, stakeholder engagement, and adaptability to different practice settings are essential to the successful implementation and uptake of a patient management process.

INVESTIGATION OF REPROCESSED INSTRUMENTS SPOTTING

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Issue: Reusable medical devises (MD) need proper reprocessing to ensure devices perform as intended and are safe for reuse. Inadequate reprocessing may be caused by factors such as failure in cleaning, disinfection, sterilization or rinsing of MD, by water quality, type and amount of detergent, or additives. Any of these may be associated with visible water-like spotting on MD. Spotting can interfere with sterilization and functioning of MD and should be managed in real time to eliminate any risks to patients' safety. Close monitoring of the reprocessing of MD leads to early identification of spotting and the initiation of appropriate steps in addressing the cause(s). Infection control professionals (ICPs) were informed of spotting on repossessed MD in a rural central Alberta hospital by the medical device reprocessing (MDR) staff in May 2019.

Project: Diagnosing the cause(s) of MD spotting can be challenging. A multidisciplinary team (MDT) of ICPs, MDR staff, facility maintenance and engineering staff, the medical officer of health and a public health inspector was established to manage the issue. The team confirmed that they were dealing with spotting caused by a residue as opposed to staining. The vendor of the automated washer disinfector (WD) machine was consulted. Water quality testing, preventive maintenance on the WD and re-calibration of the detergent delivery was carried out. This did not resolve the issue. The MDT then recommended that all operational aspects of MDR be carefully reviewed and preventive maintenance done on the reverse osmosis (RO) water system prior to any repeat water testing. The team met five times between July 30 and October 30, 2019, to successfully complete the investigation. On October 18, 2019, maintenance of the WD and RO system was done, the detergent delivery rate halved, the rinse cycle doubled and the RO rinse time decreased from 2 minutes to 1.5 minutes.
Results: The above actions successfully stopped the spotting on the MD. The vendors posited that decreasing the detergent delivery rate to half played a significant rule in resolving the spotting. Two months after there continues to be no instrument spotting.

Lessons Learned: Recognizing that no two MD are the same and following manufacturer instruction for use for any automated WD is advisable at all times. Setting up clear communication guidelines between the various departments within a rural healthcare site will ensure a well-coordinated and effective interdepartmental collaboration. Most importantly, acceptable levels of change in calibration of detergents, lubricants and other products used in automated washer disinfectors may resolve issues such as spotting on MD. Vendors of these machines can provide and assist in acceptable calibration in product measures. Consistent communication between the vendors and the MDR team regarding reprocessing of MD is important in making accurate, timely diagnosis of problems.

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NO MOTION FOR LOTION

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Issue: The World Health Organization, Public Health Agency of Canada and the Center for Disease Control all recommend the routine use of lotions in the healthcare setting to maintain and improve skin integrity. A site audit was initiated to review the lotion provided. The audit determined the approximate quantity of lotion product that has exceeded the recommended shelf-life, discuss optimal placement and provide recommendations for the disposal of expired product. Having the proper amount of product and optimized location will lead to less waste, increased utilization and therefore improved skin integrity among healthcare staff.
Project: A sample of in-patient and out-patient areas at Rockyview General Hospital in Calgary, Alberta were selected for auditing. An audit included an examination of the physical location to identify and record placement and expiry status of the lotion dispensers as well as a brief qualitative exploration of the lotion utilization culture.
Results: Nine separate areas were audited for this project, including six in-patient units; two out-patient areas; and 1 support area. The manufacturing dates for the product ranged from 2004-2018. A total of 155 lotion dispensers were audited; 87% (n=135) of the product was either expired (past recommended shelf-life) or indeterminate (not appropriately labelled with manufacturing date). Areas that had a high number of dispensers also had a high proportion of expired product. It was also noted that some housekeeping closets and unit supply cabinets had expired lotion. In discussion with the end-users and area managers, the foremost conclusion was underutilization due to product dissatisfaction including the smell, texture and prolonged wet time. Instead, staff are using alternative lotion products often brought in from home. Only 13% (n=20) of the lotion dispensers had not exceeded the recommended shelf-life. The locations in which the lotion had not exceeded the recommended shelf-life included hallway sinks, nursing desk sinks and other staff only locations. A site wide decision was made to discard all expired product and deactivate and remove all underutilized lotion dispensers.
Lesson Learned: This project revealed limited use of lotion throughout areas in the hospital resulting in excessive amounts of expired product being available for use. Healthcare facilities should ensure lotion is properly placed to maximize use and check product expiry dates on a regular basis. Likewise, it is important to have an accountability framework in place to monitor environmental service protocols for cleaning and replenishing dispenses. Staff have been encouraged to share their feedback on the current lotion product through an internal provincial product feedback program. Infection control staff should work to improve compliance with approved products otherwise staff may bring in products that do not adhere to local policy.

AHU 902: IPAC CONSIDERATIONS FOR AN HVAC SHUTDOWN AND TIE IN OF A NEW OPERATING ROOM AIR HANDLING UNIT

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Issue: A redevelopment project at an acute care hospital in Toronto required a new air handling unit (AHU) to increase capacity in the Perioperative Services Department. This necessitated a 16-hour shutdown of the existing AHU and closure of 12 operating rooms (ORs) and the Post Anaesthetic Care Unit (PACU). A shut down of air supply and exhaust fans impacts humidity, which may affect equipment and supply sterility. It also increases the potential for dust contamination of the OR environment. A procedure outlining a complete air shutdown in an OR was not found. A multidisciplinary team (MDT) was formed to mitigate the infection control risks of the shutdown.
Project: MDT meetings informed the infection control risk assessment. Alternative locations for emergency patient surgeries and recovery were required. Equipment and supplies were moved to either a safe zone created inside Pod #1, an external classroom or the elective out-patient surgical area. Pod #1 was made safe for storage of large equipment by sealing entry doors and isolating the air supply diffusers. Case carts, sterile implants and sterile supplies needed for emergency surgery on the weekend, were moved to a humidity controlled elective out-patient surgical department, located one floor below. Risk mitigation strategies were developed to minimize dust contamination from 1. debris falling from exhaust grills during existing AHU shut down; 2. the potential for supply fans to push debris past the filter system during start-up of the new AHU. Challenges included time for completion, required human resources, safe decant and relocation of sterile supply carts, erection of barriers and time for cleaning.
Results: Work was done over a long weekend to allow for the time estimated by the MDT for completion. The project manager, dedicated healthcare staff, Infection Prevention and Control (IPAC) and Operational Readiness were on site to support and assist. The designated safe zone lacked HEPA filters in supply air vents, requiring external filters to be added. IPAC staff on site was critical to provide in the moment advice on the movement of supplies prior to and upon completion of the shutdown, and on adjustment of barriers due to lack of time for completion. IPAC assumed responsibility for approving terminal cleans.

Lessons Learned: 1. Time and resources were underestimated and contractors had to work a double shift; 2. Mistaken removal of supplies increased restocking time. Communication was key; 3. Missing HEPA filters necessitated addition of external filters and relocation for equipment; 4. Number of knowledgeable health care staff to receive surgical equipment and supplies was inadequate; 5. IPAC and on-site staff worked together to address and solve challenging or unexpected issues; 6. Future shutdowns should include added time for unexpected challenges.

USING THE PROCESS OF SELF-MONITORING TO IMPROVE HAND HYGIENE COMPLIANCE AND FREQUENCY OF OBSERVATIONS

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Issue: Smoky Lake Healthcare facility (SML) had difficulty collecting hand hygiene observations to report a regular hand hygiene compliance rate. SML recruits and trains staff to act as Site-Based Reviewers (SBRs) collecting observations through direct observation. In the fiscal year 2017/18, the SBRs collected 138 observations and had a 90% hand hygiene compliance rate. Reviewer fatigue and staff not wanting to take on a peer auditing role have steadily decreased the number of observations collected over time.
Project: The project lasted three months. The site Infection Control Professional trained acute care nursing staff to collect hand hygiene observations using the provincial training tools. Portable notepads were supplied to staff to record moments of hand hygiene throughout their shift. The trained staff collected hand hygiene observations on themselves using the self-monitoring process. Two times during the project an independent hand hygiene observer would collect observations on the nursing unit. The results from the self-monitoring and the independent observer were compared to check for differences in compliance.
Results: Eleven nurses completed the provincial training tools. The number of observations collected was 251 and the hand hygiene compliance was 92%. The independent observer collected 57 observations and the hand hygiene compliance was 86%.

Lessons Learned: Staff involved in the project collaborated on the challenges of when to perform hand hygiene. There were infrastructure changes requested from staff following the project. Staff awareness of hand hygiene increased during the project in response to their direct involvement in the collection of observations. SML acute care staff continue to collect hand hygiene observations using the self-monitoring process.

RISK FACTORS FOR DEVELOPMENT OF E. COLI BACTERAEMIA IN PATIENTS WITH CANCER. THE WORK OF THE E. COLI CANCER COLLABORATIVE (UK)

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Background: Escherichia coli is a common cause of blood stream infections (BSI) in the UK which has risen significantly in the last decade. Published figures for E. coli BSI show higher rates in specialist cancer centres than in other hospitals, but the aetiology in oncology patients is not fully understood. This work describes a multicentre, multidisciplinary collaborative audit to identify risk factors in cancer patients in order to target preventative strategies for improvement of patient care and outcomes.
Methods: Five UK cancer centres collaborated to review how E. coli affects oncology patients. A key part of this work was an audit of all cases of E. coli BSI in patients over 18 years that met UK HCAI surveillance definitions. A multidisciplinary team of clinicians, nurses and pharmacists designed the audit to include more than 60 variable factors which may affect cancer patients. Results from the five centres were anonymized and amalgamated to give a stronger data set.
Results: The risk factors for E. coli among these cancer patients showed marked difference from that seen in the general UK population. The affected population was much younger and when accounting for the multiple healthcare interactions these patients have, there was a much higher rate of healthcare associated infection onset than seen in the general population. Associated mortality and

rates of antimicrobial resistance were also higher. Common univariate risk factors associated with BSI include use of systemic chemotherapy, neutropaenia, presence of acute kidney injury, presence of an invasive device, antimicrobial therapy, use of proton pump inhibitors and lack of independent hydration. Conclusion: This audit demonstrates why E. coli BSI is higher in cancer centres. Further work is ongoing to refine this data set and re-audit. The audit adds to our understanding of the impact of E. coli BSI in this vulnerable patient population and enables equitable benchmarking of cancer patients with other patient groups.

EMERGENCY DEPARTMENT SCREENING FOR HIGH CONSEQUENCE PATHOGENS

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Issue: With the recent identification of a novel coronavirus in Wuhan, China, the importance of screening patients with infectious symptoms for a relevant travel history is once again top of mind. Identifying syndromic patients with epidemiologic exposure on presentation is paramount to protecting other patients and healthcare workers.
Project: Our team sought to 1) review and enhance the symptom and travel screening process in the emergency department (ED), and 2) to devise a system to ensure all HCWs have easy access to up to date information on areas of the world where high consequence pathogens (HCP) are currently circulating. A stakeholder group from the ED was engaged in the quality improvement project.
Results: Chart audits in the ED revealed low completion rates of the previous screening form (30/98, 31%); however, patients presenting with infectious symptoms were appropriately placed on Additional Precautions most of the time (9/10, 90%). Feedback from ED stakeholders suggested that the main barrier to Infection Prevention and Control (IPAC) screening was the lack of updated advisories in triage and the usability of the screening form. The IPAC team worked in conjunction with ED staff to make the screening form more concise and user friendly, and an intranet page, listing HCP areas of concern, was created along with a process to ensure this information is regularly reviewed and updated.
Lessons Learned: These simple process changes integrated into the ED workflow have enabled improved IPAC screening. However, much of the ED triage process is done electronically and so the completion of a paper form remains a barrier. As a future step, it is hypothesized that a technological intervention that incorporates symptom and travel screening as a forced function into the existing electronic triage process would yield higher compliance, but this is currently not feasible. The creation of an intranet page listing HCP areas of concern has been beneficial in that staff have continuous access to this information. The process of ensuring this information is kept up to date is not without its limitations however, and so advocating for the creation of a national or provincial IPAC-focussed resource would ensure all healthcare organizations have access to current HCP areas of concern.

HELP! WE'VE BEEN EXPOSED – HOW A MULTI-FACETED TOOLKIT CAN EXPEDITE POST-EXPOSURE FOLLOW-UP FOR VARICELLA ZOSTER VIRUS (VZV)

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Issue: Post-exposure follow-up for Varicella zoster virus (chickenpox or disseminated zoster) can be overwhelming for an infection control professional due to the potential for extensive patient exposure follow-up within a constrained timeframe. This includes determination of whether a high-risk exposure has occurred and identifying patients and staff meeting exposure criteria. Diligent communication to several key personnel must occur immediately, such as to exposed patients, impacted program(s), Occupational Health and most-responsible physicians. In addition, clear documentation of disclosure of exposed patients must be completed and any required post-exposure prophylaxis for patients and staff must be conducted.
Project: A working group was established that consisted of infection control professionals, an Infectious Diseases physician and Infection Control management. A needs assessment was conducted where existing data on previous VZV post-exposure processes was analyzed. Input from various infection control professionals from the department was gathered; and Best Practices from various national and international bodies were referenced. The assessment revealed the unified need for a post-exposure follow-up process to ensure a thorough, efficient, and standardized internal departmental approach among infection control professionals.
Results: To create a standardized post-exposure VZV process, an intuitive and simplified multi-step toolkit was created. The resultant toolkit contains: 1. A comprehensive exposure checklist with task items for the ICP to complete; 2. Simplified exposure criteria, which assists the ICP in determining whether an exposure occurred and which patients/staff are involved; 3. A pre-built line-list; 4. Template communications to affected program, Occupational health, and physicians; 5. Template patient letter pre-populated with e-signatures of appropriate individuals.
Lessons Learned: Having a streamlined toolkit improved patient and staff safety by ensuring that all exposed individuals are identified, notified and, if necessary, provided post-exposure prophylaxis in a timely manner. The toolkit also mitigated risk of miscommunication, or lack of communication, among stakeholders and exposed staff and patients. Finally, the toolkit expedited and simplified the otherwise labor-intensive process involved in a post-exposure follow-up for the infection control professional, thus reducing time and stress and ensuring that patient safety is prioritized.

SCRATCHING THE SURFACE: SCABIES OUTBREAK IN AN INTENSIVE CARE UNIT

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Issue: Sarcoptes scabiei, an ectoparasite, causes skin infections. Diagnosis is challenging. Mites burrow under the skin, resulting in an initial appearance resembling mosquito bites or acne and clinicians may attribute presenting symptoms to other causes such as an allergic reaction. Over time, scales or blisters form and the patient experiences intense itching. A six-week incubation period for an initial infestation is common. A patient at a central Alberta hospital presented with skin lesions and was initially on additional precautions. Precautions were discontinued based on diagnosis of an allergic reaction. Dermatology diagnosed scabies 140 days later. The patient lacked the ability to communicate his needs and required high contact care in the Intensive Care Unit (ICU). The result was transmission to staff. A scabies outbreak was declared that lasted 2.5 months.
Project: An interdisciplinary committee, including the Medical Officer of Health, Infection Control Professionals (ICP), Occupational Health Nurse, Unit Manager, Director of Cardiac Sciences and Critical Care, and the Public Health Inspector, oversaw the scabies outbreak. The committee reviewed the status of the index case, additional cases, infection prevention strategies, and learned together. All interactions with patients or patient environments required contact precautions until all unit staff and patients received treatment or prophylaxis. Contact tracing of potentially exposed patients required identification of patients admitted to the ICU during a 140-day period prior to the index case diagnosis of scabies and the outbreak declaration. Patients were notified through communication to their physician. Due to interfacility-transfer of patients, communication occurred with nine other healthcare facilities within the province.
Results: Two patients were affected. The index case was the sole lab-diagnosed case; the second patient was self-diagnosed. Twenty-six staff, either self- or physician-diagnosed, were affected. Contact precautions were maintained until all potentially exposed staff and patients, including those transferred out of the ICU, received prophylaxis. Control measures of contact precautions; prophylaxis, one dose of permethrin; and treatment protocol, at least two doses of permethrin, resulted in no transmission to further patients or staff.
Lessons Learned: It is challenging to diagnose scabies. Nurses learned the importance of applying additional precautions consistently based on presenting symptoms. Following routine practice, including a point-of-care risk assessment, supports transmission prevention even with inconsistent application of additional precautions. Communication and collaboration with other areas in the facility were originally missed and a few individuals were not included in the initial outbreak committee. Outbreak management requires a concerted team effort.

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LACK OF HIV PRE-EXPOSURE PROPHYLAXIS (PREP) AWARENESS REPRESENTS A MAJOR KNOWLEDGE GAP AMONG GAY, BISEXUAL AND OTHER MEN WHO HAVE SEX WITH MEN IN ONTARIO

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Issue: While clinical and observational data have demonstrated HIV Pre-Exposure Prophylaxis (PrEP) reduces the risk of HIV transmission, most gay, bisexual and other men who have sex with men (gbMSM) may be unaware of this highly effective option for HIV prevention. According to 2016 national HIV estimates, over half (52%) of all new HIV infections in Ontario occur among gbMSM. Yet, limited research exists to assess PrEP awareness and uptake as a prevention tool among this population.

Project: To address this knowledge gap, we conducted a questionnaire from June 2018 to March 2019 among gbMSM living across Ontario.

Results: A total of 1560 HIV negative gbMSM completed the questionnaire. The mean age was 37.3 years (SD = 14.7). The majority (95%) reported sex with only or mostly men and the remainder were bisexual. With respect to PrEP use, only 10% reported they were currently taking PrEP. Toronto (21%) and Ottawa (13%) had the highest uptake of PrEP, whereas northern (4%) and eastern Ontario (3%) had the lowest. Over half of respondents that live in northern (59%) and southern (56%) Ontario had never heard of PrEP or knew very little about it. Not knowing what PrEP is or how to access it were significant barriers for younger gbMSM, with lack of awareness being as high as 60% in many regions of Ontario.

Lesson Learned: To advance a culture committed to infection prevention and control, future educational efforts should address how to increase PrEP awareness and access among this most at risk population.

TAMING THE BEAST: HOW WE GOT RESULTS FROM OUR FLU CAMPAIGN

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Issue: There is a difference between flu immunization compliance and flu immunization 'status known'. The first implies that all workers who got their vaccination have provided proof to Occupational Health Safety and Wellness (OHSW). The latter indicates all staff must identify their status (vaccinated, declined or medical exemption). It has been presumed that in the past campaign seasons, those receiving a flu shot in a community clinic have not accurately been included in the compliance statistics reported to Public Health. In order to gather this information, status known was incorporated into policy. Our 2017/18 stats indicated 64% of staff received the flu vaccine. With no onus to provide this information but hopeful on accountability, the data was felt to not actually reflect the true status. In the 2017/18 flu season, an outbreak was declared. In the moment, data as to who could remain on the unit as per the Ontario Hospital Association Communicable Disease Standards became an immense undertaking. That unit only had 33% compliance by the collected data. Presumably, 67% of the staff had to be redeployed.

Project: To improve compliance rates regarding influenza immunization 'status known'. Having precise information effectively supports efforts for being prepared for an outbreak. When accurate information is gathered, management of outbreaks becomes a much more fluid process. Mandatory influenza immunization status reporting became the focus and was supported by Senior Team. Strategies included policy and procedures to reflect processes, mass email communication, posters and presentations, OHSW and IPAC attendance at staff meetings and 'team huddles', and a mandatory educational module to be completed by all staff annually. Other strategies included mock outbreaks and messaging at fixed and mobile flu immunization clinics. The perceived largest attraction was offering full sized chocolate bars to every worker who received an influenza vaccine.

Results: A rate of 99.2% employee compliance 'status known' was reached in the 2018/2019 season. The final immunization compliance rate for 2018/2019 was 78.5% an increase from the previous years. As of December 24, the current 2019/2020 status known rate is 99% and the immunization compliance rate is currently 81.4%

Lesson Learned: Collaboration approach is key. The OHSW cannot do it on their own. Key stakeholders include IPAC, Decision Support Unit, Human Resources, Senior Team, Communications department and unit managers. By enforcing our existing staff influenza immunization policy – which requires staff inform the OHSW department of their vaccination 'status' – we have subsequently seen an increase in reported staff immunization rates.

CPE AND DRAINS THE ANSWER LIES WITHIN! A MADE IN-HOUSE DISCHARGE PROTOCOL FOR DRAINS EXPOSED TO CPE

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Issue: Drains in patient rooms have been implicated in transmission of carbapenemase-producing Enterobacteriaceae (CPE) throughout Ontario. Use of disinfection agents alone may be ineffective for complete eradication of biofilm containing CPE in drains. The Provincial Infectious Disease Advisory Committee (PIDAC) guidance document for Environmental Cleaning for Prevention of Infections in All Healthcare Settings recommends that facilities have policies/procedures for rooms occupied by patients with CPE. Existing sample protocols available in the PIDAC document yielded implementation concerns and were not compatible with our hospital policies, procedures and external standards/codes. In absence of published evidence-based strategies, our hospital struggled to find the best solutions to prevent and manage biofilm buildup in drains potentially contaminated with CPE. We describe the journey our hospital took to solve this dilemma. Halton Healthcare is a tri-hospital community organization with a combination of new Public Private Partnership (P3) hospital builds as well as older hospital owned facilities.

Project: Infection Prevention and Control (IPAC) set out to create an organization specific drain preventative maintenance program to be performed when patients with confirmed CPE are discharged. A multidisciplinary working group was created inclusive of various stakeholders including IPAC, facility maintenance, environmental services, clinical staff, and industry partners. Process improvement and brainstorming sessions were conducted including evaluation of new technologies, efficacy, time trials, safety, economic impact as well as ease of adoption of interventions.

Results: A specific drain preventative maintenance discharge protocol was created. The protocol is utilized for rooms occupied by CPE positive patients for greater than 48 hours. The process includes drain disinfectant using a viscous 2.4% Sodium Hypochlorite. The disinfectant is easy to source, financially feasible, user friendly and consistent with the same active ingredient used in cleaning/disinfecting room surfaces. The next step is tail pipe and p-trap replacement of patient and hand hygiene sink. Results of time trials indicated that replacing tail pipe and p-trap was quicker than physical biofilm removal by brushing, cleaning/disinfection. Hospital-specific algorithms, policies, procedures, job aids, staff training and communications were created to support the new process. After each CPE discharge protocol is complete, the team reviews opportunities with the goal of continuous improvement.

Lessons Learned: In the absence of widely tested evidence-based strategies for removal of CPE in drains, it is important for healthcare facilities to engage stakeholders, research alternative products and conduct trials to find the best organization specific solution. Collaboration between stakeholders has led to important relationship building.

IS MYCOBACTERIUM CHIMAERA TRANSMISSIBLE PERSON TO PERSON?

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Issue: Two cases of Mycobacterium chimaera were diagnosed in patients admitted consecutively to the same airborne infection isolation room (AIIR) in an acute care academic hospital in 2019. The first identified patient (Patient A) had disseminated M. chimaera found in a bone marrow biopsy, and the second patient (Patient B) had M. chimaera in the sputum. Patient A was admitted in the AIIR of concern for four days on airborne precautions and Patient B was admitted hours later to the same room, for six days also on airborne precautions. The medical team requested Infection Prevention and Control (IPAC) to conduct an investigation to determine if there was transmission of M. chimaera between these two patients. M. chimaera is a nontuberculous mycobacterium belonging to the Mycobacterium avium complex (MAC) and is an opportunistic pathogen commonly found in water. M. chimaera has been of concern recently due to aerosolized transmission from contaminated heater cooler devices used intraoperatively causing infections in post-operative cardiac patients.

Project: The IPAC team conducted an investigation to determine if there was transmission of M. chimaera from Patient A to Patient B. Chart reviews of both patients were completed and the specimens were sent to the National Microbiology Laboratory (NML) to determine relatedness. A literature search of M. chimaera was also performed to review if there were any reported cases of human to human transmission.

Results: Patient A's symptom onset began approximately three months prior to admission, and the infection was presumed to be related to a contaminated heater cooler during cardiac surgery in another facility 18 months prior. Patient B's symptoms of fever, malaise, cough and foul-smelling sputum began 11 days prior to admission. Patient B received empiric treatment for community acquired pneumonia with clinical improvement. Besides sharing the same AIIR at different times, no other epidemiological links such as common procedures (e.g. bronchoscopy), respiratory equipment or medications were identified. Whole genome sequencing revealed that there was no genetic link between the two cases. Patient A's M. chimaera strain was closely related to the global heater cooler outbreak strain, and Patient B's M. chimaera strain was unrelated to the heater cooler strain. Our literature search did not reveal any definitive evidence of human to human transmission of M. chimaera.
Lesson Learned: Our investigation determined there was no evidence of human to human transmission of M. chimaera in our two patients, and there has been no definitive evidence of human to human transmission reported in the literature. M. chimaera in respiratory specimens can sporadically occur and is most likely attributed the ubiquitous nature of M. chimaera in water. This is in contrast to invasive M. chimaera infections that have been introduced during cardiac surgery by heater cooler units contaminated with the global M. chimaera outbreak.

PAPER TO PHONE – MAKING HAND HYGIENE AUDITING EASY AND REDUCING THE HAWTHORNE EFFECT

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Issue: The Hawthorne effect (also referred to as the observer effect) is a type of reactivity in which individuals modify an aspect of their behavior in response to their awareness of being observed. We all are aware of the Hawthorne effect while auditing hand hygiene compliance rate. But still many believe that the 90% plus rates we publicly report are true rates. This is especially the case when we perform hand hygiene audit with a clip board, making it very obvious to the front-line staff. Infection Prevention and Control (IPAC) wanted to obtain closer to the true rate of hand hygiene compliance by reducing the Hawthorne effect.
Project: Based on the high hand hygiene compliance rates, IPAC was suspicious that the rates may not be accurate. In addition, the accountability of doing the audits was on the IPAC team as very few front-line staff volunteered to become auditors. IPAC goal was to: (a) get a true picture of actual hand hygiene compliance rate and (b) increase the involvement of the front-line staff to become hand hygiene champions and volunteer to audit their peers. Like most of the hospitals in Ontario, due to limited funds we could not purchase/subscribe an electronic system. However, by utilizing Public-Private Partnership initiative, IPAC was able to implement an online web portal that allowed us to view, aggregate audit data and create reports filtered by date, auditor, location and profession. The auditors could collect hand hygiene audits either on their cell phones, tablets or computer making it less obvious.
Results: Information gathered from the web portal clearly showed a significant drop in the compliance rate by ~25% initially supporting the Hawthorne effect theory. In addition, because the audit tool was on the cell phone instead of carrying a paper form, we had an increase of front-line staff participating as hand hygiene auditors as they found the app user-friendly and exciting to use. Participation of front-line staff to volunteer as hand hygiene auditors increased by 40% as we implemented the new system. As our hand hygiene auditors increased, so did our hand hygiene compliance rate, as the auditors became more observant and compliant in doing appropriate hand hygiene. In addition, with the technology we have invested in, we are also able to audit appropriate usage of personal protective equipment (PPE).
Lessons Learned: Like other hospitals that used paper-based hand hygiene auditing system, the rates we initially reported were higher than the actual rates due to the Hawthorne effect. In addition, we all are aware that hand hygiene does not motivate our front-line staff as it may feel like a broken record that has been playing for over 12 years. The key to keeping the front-line staff interested and invested in hand hygiene is to come up with innovative ideas when it comes to the process of auditing, in order to stimulate and avoid burn out.

A QUANTITATIVE EXAMINATION OF CANADIAN INFECTION CONTROL PROFESSIONALS' SUBJECT MATTER EXPERTISE, EXPERIENCE AND USE OF AVAILABLE RESOURCES IN THEIR ROLE OF ADVISING ON CONSTRUCTION, RENOVATION AND MAINTENANCE IN ACUTE CARE CANADIAN HOSPITALS

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Background/Objectives: Construction activities, on-going in Canadian hospitals create a risk of invasive fungal infections and infections due to Legionella spp. Infection control expertise is required to educate contractors, conduct risk assessments and audits and provide recommendations. Infection Prevention and Control Canada (IPAC) provides eight construction related competency statements for Infection Control Professionals (ICP's). A quantitative research project was conducted to determine whether acute care ICP's in Canada, providing advice on construction, have the necessary education, experience and knowledge of resources. Secondary objectives addressed geographical differences, level of confidence, knowledge of specific construction topics and gaps in education and resources. Methods: A quantitative research method was conducted, using an electronic multiple-choice questionnaire. APIC (Association for Professionals in Infection Control and Epidemiology) and IPAC Canada's competency tools were used to develop the questionnaire and survey content validated. The survey, conducted from August 7 to August 21, 2018 was sent to 833 members of IPAC Canada. Consent was voluntary and the data was collected to ensure anonymity. The raw data generated was collated and analysed.
Results: The majority pf respondents (86%) were from teaching hospitals with greater than 100 beds, resulting in a 10.3% response rate. Approximately 80% had taken CSA's construction fundamentals course, 50% had taken CSA's Implementation course and 13% had taken the CSA Z8000 course. There were 11% without formal coursework. The majority of respondents rated their knowledge of the CSA construction standard high and their knowledge of CSA plumbing and HVAC standards low. Approximately 30% had at least 10 years of experience and almost half had been involved in major demolition including phased moves. Some facilities (14%) had hired an external IPAC resource for construction in the previous five years. Approximately 40% felt very confident or confident and 25% felt not confident, conducting infection control risk assessments (ICRA's). Those not confident had significantly less experience dealing with air handling, hoarding, plumbing or building structural issues. There was no significant difference in ICP's experience and knowledge across different regions in Canada.
Conclusion: The small sample size was a limitation. The majority of respondents had the knowledge and experience to provide expert IPAC advice. Knowledge of plumbing, air handling, structural and electrical were identified as gaps affecting the level of confidence doing ICRA's. These results may be helpful in informing future learning opportunities for ICP's.

SUPPLEMENT TO THE CANADIAN JOURNAL OF INFECTION CONTROL
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FROM DEATH BY POWERPOINT TO INTENTION TO CHANGE – ENGAGING INFECTION CONTROL CHANGE AGENTS IN HEALTHCARE SETTINGS TO MEET BEST PRACTICES: IMPLEMENTING PUBLIC HEALTH ONTARIO'S IPAC EDUCATION STRATEGY

Laurie Dawn Boyer[1], Vicky Willet[1], Amanda Brizard[1]
[1]Public Health Ontario

Public Health Ontario's (PHO) Infection Prevention and Control (IPAC) Regional Support Teams have traditionally undertaken activities in support of the dissemination of IPAC Best Practices. In many cases, education delivery has been confined to simple dissemination of knowledge, which has been self-limiting in its impact on subsequent change and improvement to processes and outcomes. Learning from the fields of knowledge translation and implementation science, as well as adult learning theory has informed PHO IPAC to develop an Education Strategy ("the Strategy"). Application of the Strategy has allowed our Team of IPAC Specialists to provide our IPAC Professional (ICP) stakeholders with interactive opportunities to engage with best practice content, each other and ourselves, providing them with an opportunity to move beyond simply receiving dissemination messaging and toward the role of change agent and implementer.

Project: This presentation will describe the experience and utility of using the Strategy, the potential to utilize the strategy in planning, delivering and evaluating interventions targeting building capacity for change agency among Infection Prevention and Control Professionals and other leaders, as well as data from evaluation indicating stakeholder's intention to change related to session delivery. Our team of Infection Prevention and Control (IPAC) Specialists utilized a novel education strategy to assess stakeholder need and design an effective engagement approach, which resulted in stakeholders expressing in writing their intention to undertake practice change to adopt evidence-based best practices. The approach developed afforded the participants a voice in selecting the subject to be addressed, an opportunity to consider and document their concerns on the subject, engage in problem solving discussion with peers, and document their intention to move to action upon return to the healthcare setting. Utilizing evaluative thinking as outlined in the Strategy, our team initially conducted a needs assessment which served to identify broad areas of desired learning among our stakeholders. Engagement sessions were planned based on the gaps identified in the needs assessment rather than focusing on delivery of content. On the day of the event, participants chose the focus of the session from among several related concepts. Participants were asked to 'vote' on the sub-topics of interest using the "dot-mocracy" method. A worksheet was provided for participants to write down a related issue in their setting. Groups discussed the topic of interest, identified gaps and solutions to implement best practices.

Results: Participants evaluated the subject matter to be applicable, mode of delivery as effective, and the opportunity to conduct additional discussion with peers as likely to be useful to them. 88% of completed evaluations (n=26) indicated that participants planned to make change to their IPAC practices or those at they plan to target for change.

Lessons Learned: The principles within the Education Strategy guided this approach making sessions more relevant to participant's learning needs. The worksheet helped them develop a plan for change within their individual setting. Implementing the Education Strategy afforded our team the opportunity to plan sessions to assist stakeholders in adopting best practices.

By documenting the process, we were able to ensure alignment with the goals of PHO's IPAC Education Strategy in the areas of evaluative thinking, needs assessment, and defining the approach and roles in innovative educational modalities that promote active learning opportunities for stakeholders.

Implementing the PHO IPAC Education Strategy as a framework for planning and carrying out the session allowed our team the opportunity to thoughtfully plan and carry out the sessions, with the end goal of designing sessions that will assist stakeholders in adopting IPAC best practices. Since holding the initial series of four in-person sessions, our Team has been evolving the approach and applying it to sessions delivered using distance delivery modalities. While we have completed evaluation of the in-person sessions, we continue to provide sessions to various stakeholder groups at the time of submission of this abstract. Formative evaluation of sessions delivered by way of this modality is in process. We will plan to update the "results" section of our presentation with additional data as it becomes available.

ORANGE YOU GLAD YOU PREPARED!

Natasha Salt[1], Jerome Leis[1], Claudia Cocco[1], Lorraine Maze Dit Mieusement[1]
[1]Sunnybrook Health Sciences Centre

Issue: Sunnybrook Health Sciences Centre (SHSC) is a 1,355-bed quaternary care centre, in Toronto Ontario. A Code Orange at SHSC represents a response to: mass casualty incidents; chemical, biological, radio-nuclear, explosive or environmental (CBNRE) events due to natural, accidental or intentional acts; and pandemics. Maintaining preparedness for high consequence pathogens (HCP) and mass casualty incidents are priorities. Over the past three years, SHSC has had several Code Orange events: six major exercises, multiple small-scale exercises and three real events. Each event presented IPAC an opportunity to enhance preparedness, response and recovery activities.

Project: Under the leadership of the SHSC Emergency Preparedness team, multiple stakeholders throughout the organization were identified to participate in the preparation, execution and debrief of each code orange exercise. After action reports collated the findings and identified key opportunities for improvement. Three major exercises and their outcomes will be described: A mass casualty related to an intentional act and two incidences related to HCP.

Results: All three exercises were successfully executed with internal and external stakeholder engagement. Two were table-top exercises and one a live exercise. Several opportunities to enhance infection prevention and control were identified with each event: optimize environmental support services, evaluation of surge spaces, opportunities to cohort or discontinue additional precautions, prioritize placement of IPAC coordinators, suspension of non-priority program areas, support patient flow, improve notification and fan-out process, identify and mitigate risks to patient safety, improve contact tracing capabilities, expedite identification and placement of patients presenting with a HCP. As a result of these exercises, several processes were identified for improvement and an IPAC-specific fan out list and all hazards business continuity plan was developed.

Lessons Learned: Emergency exercises can be large scale and complex in nature involving many stakeholders but may also be small and targeted in order to test a specific process. IPAC matters in all emergency responses and during a code orange event. Participating or supporting development of exercises and plans should be a priority for an IPAC team. Learnings applied from code orange exercises or events are transferable to regular business operations such as surge planning which supports occupancy pressures.

WHAT'S OLD IS NEW AGAIN – RE-LAUNCH OF A VRE CONTROL PROGRAM IN A REHAB/COMPLEX CARE HOSPITAL

James Wong1, Lauren McLeod[2], Liz McCreight[2], Jennie Johnstone[2], Linda Shi[2]
[1]Sinai Health System, [2]Sinai Health

Issue: Beginning in 2012, some healthcare facilities in Ontario discontinued their VRE control programs. In the absence of strong data supporting its effectiveness, some could not justify the additional laboratory costs of screening, as well as costs associated use of Contact Precautions including personal protective equipment, cleaning and loss of private room income. In 2013, prior to merging our acute care and rehab/complex care (CC) hospitals, our rehab/CC hospital decided to stop their VRE control program. In 2019, Public Health Ontario issued guidance supporting use of active VRE screening programs and use of Contact Precaution for those colonized and/or infected with VRE, given emerging data demonstrating effectiveness of VRE control programs. Herein, we describe re-implementation of a VRE control program.

Project: Six years had elapsed since the discontinuation of the VRE control program. Senior leadership support was extremely important to begin the process of re-launching the program. We then mapped the entire process for roll-out in order to maintain momentum and be able to track the completion status of each task. One of the most important early questions was to determine the baseline VRE prevalence for our hospital. A decision to screen only the long-stay patients was determined as a good indicator of VRE prevalence. A communication plan was created to ensure all staff and affected patients were aware of the change. This included speaking to those positive patients that remained in the hospital for the launch and providing a fact sheet for them. Nursing leadership was involved in ensuring nursing practices were updated. Changes in the hospital electronic medical record (EMR) were needed. A plan to audit admission swabs collection would be able to identify areas for improvement and additional education.

Results: Six inpatient units were screened and a 4% positive rate (n=7/171) was identified. Hospital-wide policies were updated to reflect the VRE control program; all admitted patients were to be screened for VRE, as the vast majority

was transferred from another healthcare facility. Nursing Medical Directives were updated to include VRE admission swabs. A Practice Alert, fact sheet and email communication were created to further inform clinicians of the change. We attended huddles and morning report as part of the education roll-out. Changes in the EMR had to happen in order to account for the addition of VRE admission screening, changing the collection site from perineum to rectal, and updating IPAC documentation to include VRE. Upon initial roll-out, there was a plan to audit all new admissions for swab compliance. Competing hospital projects and department moratoriums led to a launch delay of four months.
Lesson Learned: Early stakeholder involvement and mapping of the processes required are two key steps to ensure a smooth launch. Consideration for unforeseen delays and department resources should be built-in the plan.

EBOLA PREPAREDNESS: COLLABORATIVE APPROACH IN CREATING A STATE OF READINESS

Joan Osbourne Townsend[1], Andrea Morillo[1], Andrea Matte[1], Jane Cornelius[1], Rosa Spataro-Sherman[1], Nataly Farshait[1]
[1]Humber River Hospital
Issue: The Ebola outbreak in Democratic Republic of Congo began in August 2018. To date, there has been over 3,000 confirmed cases and over 2,000 deaths. This outbreak is the second largest in history, second only to the West Africa outbreak of 2014 that caused over 11,000 deaths. Global travel has heightened the threat of spreading communicable diseases from one region to another. Located 10 minutes from Pearson International Airport, Humber River Hospital will likely be the first to receive patients with potential exposure to Ebola Virus Disease upon their arrival in the city.
Project: Multidisciplinary working group collaborated to implement a state of readiness; this included the use of PDSA cycles to ensure the frontline staff training was well received, list and type of supplies and personal protective equipment (PPE), and alignment/implementation of policy and procedures based on best available evidence.
Results: Registered Respiratory Therapists trained in the use of the PPE utilizing Powered Air-Purifying Respirator (PAPR) trained emergency staff and physicians. Fully equipped "ready to use" Ebola carts containing all the personal protective equipment required, PAPR devices and charge stations, as well as visual guides on donning and doffing procedures have been stored in the Emergency Department and other critical outpatient locations throughout the hospital. All training, equipment and educational materials are supported by policies and procedures, which in turn are aligned to CDC and WHO recommendations on Ebola containment and response strategies.
Lessons Learned: By 2015 alone, six other countries had reported an imported Ebola case or cases (Mali, Senegal, Nigeria, Spain, the United States of America, and the United Kingdom). These have now been controlled. All of these examples confirm that a rapid and strong response to an Ebola outbreak is not only essential, but possible, and is the most important factor in controlling the disease and consequently stopping its spread. As the number continues to grow, maintaining a state of readiness has proven to be a dynamic process that requires continuous monitoring, coordination, and improvement.

CANDIDA AURIS: PROSPECTIVE IDENTIFICATION AND MANAGEMENT: JOURNEY TO DATE

Joan Osbourne Townsend[1], Andrea Morillo[1], Lillian Kariko[1], Joanna Widla[1], Seema Boodoosingh[1], Nataly Farshait[1]
[1]Humber River Hospital
Issue: Candida auris (C. auris) is an emerging fungus that presents a serious global health threat. C. auris is highly communicable and causes severe illness in hospitalized patients. Patients can remain colonized with C. auris for a long time and C. auris persists on surfaces in healthcare environments. In April 2019, Humber River Hospital, a large community hospital in Toronto Canada, identified the first prospective case of C. auris in Ontario.
Project: Humber River Hospital implemented a screening protocol for high risk patients based on PIDAC's Interim Guide for Infection Prevention and Control of Candida auris issued in January 2019. Screening criteria include patients coming from areas where C. auris is endemic or where transmission has been documented, travel history to the Indian subcontinent, known colonization or infection with CPE, and history of intrusive antifungal use. The first patient to be identified in Ontario was screened for C. auris on admission based on the aforementioned criteria. C. auris is known to be a resilient organism that can survive for prolonged periods of time in surfaces and can resist routine cleaning with common hospital-grade disinfectants. In consequence, the patient was placed in a private room on enhanced droplet and contact precautions, with controlled traffic into the room using an ante-room, and dedicated equipment. Disinfection protocol includes twice a day environmental cleaning and disinfection with bleach-based disinfectant, as well as double-cleaning, ultraviolet light irradiation and quarantine for all medical equipment that needs to be removed from the room. Transmission was monitored through screening all ward mates upon discharge from the unit at days zero, seven and 21, with all patients remaining on contact precautions until results were confirmed negative. Education to staff was delivered through rapid PDSA cycles to support validation and promotion of learning; practices were promptly documented in policies/procedures for screening, testing and identification of patients at risk and/or colonized with C. auris; microbiology methodology for accurate identification of the organism was conducted; and patient and family information resources were developed.
Results: HRH realized zero hospital acquired transition over the nine-month admission, with over 600 ward mates screened to date. Rapid "theory burst" in-services were well received by staff; engaging patients and families in the design of information resources and protocols created investment.
Lessons Learned: 1. Multidisciplinary approach is necessary to prevent and control transmission of Candida auris within the healthcare setting; 2. Resources that aligns with best practices; 3. Communication with senior management is essential.

REDUCTION OF NEEDLE STICK INJURIES AMONG HEALTHCARE WORKERS AT KOIDU GOVERNMENT HOSPITAL: AUGUST TO OCTOBER 2019

Abu Gbondo[1]
[1]Ministry of Health and Sanitation
Background/Objectives: Needle stick and sharps injury (NSI) is an accidental penetration of the skin by a needlepoint or other piercing instrument. Healthcare workers (HCWs) are frequently exposed to sharps injuries, with the risk of serious illness. In the USA, hospital-based healthcare personnel sustain approximately 385,000 needle stick and other sharps-related injuries each year (CDC, 2008). In Sierra Leone, neither the prevalence nor the factors associated with HCW-acquired NSI is known. Koidu Government Hospital (KGH), a secondary/referral hospital, located in Koidu City, Kono District, provides medical services to adults and children, with 160 beds and 200 staff. In our setting, sharps injuries are often not taken seriously due to lack of HCW understanding of the magnitude of the risk of NSIs or the practices associated with it, and so many go unreported. A preliminary study showed that 66% of HCWs in KGH have experienced NSIs (FETP frontline SL, 2019). Our objective was to reduce NSIs to zero in three wards in KGH from August to October, 2019. Methods Our quality improvement initiative on three wards in KGH from August to October, 2019 included collection of baseline and bi-weekly data on any NSIs using a structured questionnaire, and design and implementation of an intervention package comprising of training, distribution of materials for reminder such as posters, and workflow re-organization. We measured effectiveness of the intervention based on numbers of NSIs, using quality improvement plan-do-study-act (PDSA) cycles.
Results: Twelve NSIs were reported in the three wards in the previous quarter, which provided our baseline. The major reasons identified by HCWs who reported these were lack of knowledge (78%), unorganized workplace (47%), and limited space in the ward area (44%). Following our intervention, NSIs was reduced by 83% to two.
Conclusion: The prevalence of NSIs in our three study wards was high, but through training, workplace reminders, and reorganizing of the workspace, it was reduced dramatically within three months. Consequently, we are initiating the intervention of HCW training, materials and workplace reminders, and workflow re-organization in the remaining wards. We also continue to track and report all NSIs and reinforce the intervention on the initial three wards to ensure sustainability.

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TARGETING INFECTION PREVENTION AND CONTROL GAPS IDENTIFIED DURING LASSA FEVER OUTBREAK INVESTIGATION

Abu Gbondo[1]
[1]*Ministry of Health and Sanitation*

Background/Objectives: Needle stick and sharps injury (NSI) is an accidental penetration of the skin by a needlepoint or other piercing instrument. Healthcare workers (HCWs) are frequently exposed to sharps injuries, with the risk of serious illness. In the USA, hospital-based healthcare personnel sustain approximately 385,000 needle stick and other sharps-related injuries each year (CDC, 2008). In Sierra Leone, neither the prevalence nor the factors associated with HCW-acquired NSI is known. Koidu Government Hospital (KGH), a secondary/referral hospital, located in Koidu City, Kono District, provides medical services to adults and children, with 160 beds and 200 staff. In our setting, sharps injuries are often not taken seriously due to lack of HCW understanding of the magnitude of the risk of NSIs or the practices associated with it, and so many go unreported. A preliminary study showed that 66% of HCWs in KGH have experienced NSIs (FETP frontline SL, 2019). Our objective was to reduce NSIs to zero in three wards in KGH from August to October, 2019. Methods Our quality improvement initiative on three wards in KGH from August to October, 2019 included collection of baseline and bi-weekly data on any NSIs using a structured questionnaire, and design and implementation of an intervention package comprising of training, distribution of materials for reminder such as posters, and workflow re-organization. We measured effectiveness of the intervention based on numbers of NSIs, using quality improvement plan-do-study-act (PDSA) cycles.
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FLEXIBLE ENDOSCOPE REPROCESSING UPDATES

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1 London, Ontario

Issue: Multiple types of flexible endoscopes have been linked to outbreaks and infections despite following manufacturers' instructions for use (MIFU). It has been reported that 58% of reprocessed endoscopes contain microbes. Bacteria such as carbapenemase-producing Enterobacteriaceae (CPE) which have been linked to outbreaks are difficult to treat. The persistent infection transmission risk is alarming. Over time the initial function of observational device for endoscope has long been changed. Videoscopes with built-in cameras are being utilized in minimally invasive surgical procedures in which endoscopes or accessories contact sterile tissue. Despite considerable advancements in endoscope technology, endoscope reprocessing has not received significant amendments. The complexity of scopes, the increase in critical usage, risk of being easily damaged, heavy soiling and potential for contamination with multidrug-resistant organisms are among a multitude of factors which contribute to increased infection risks for patents.
Project: To analyze the current literature and global guidelines on endoscope reprocessing methodologies, new technologies available and propose a comprehensive procedure for endoscope reprocessing.

Results: Consistent adherence to clearly defined cleaning and reprocessing steps is critical for effective endoscope reprocessing. Manual cleaning is an important step which is prone to human error. Visual inspection cannot verify the efficiency of manual cleaning due to endoscope design. It is also essential to have quality controls in place to detect endoscope damage in real time. Potential ways to improve endoscope reprocessing could include, but are not limited to, enhanced thoroughness of manual cleaning, specific instructions for elevator mechanisms and biopsy channels, use of a magnifying lens or borescope, period microbial testing and culturing, double cleaning and reprocessing, and utilizing disposable parts, etc.
Lesson Learned: A comprehensive endoscope reprocessing plan that is based on the best practices identified in this project needs to be developed. It is essential to focus on all cleaning and reprocessing steps as well as implementing methods to verify manual cleaning efficacy. In particular, the use of an audit tool for performing quick tests for the measurement of adenosine triphosphate (ATP), protein and carbohydrate have been recommended in current guidelines. Where possible, consideration should be given to moving from high-level disinfection (HLD) to sterilization. Utilizing innovations in endoscope design, increased training and competency and following the latest guidelines from professional organizations such as CSA, PIDAC, PHAC, SGNA, AAMI, FDA, CDC, ASM will result in properly reprocessed endoscope equipment and the highest level of patient safety.

INFECTION PREVENTION AND CONTROL LESSONS LEARNED IN THE OPERATION AND MANAGEMENT OF WARD BEDPAN WASHER DISINFECTORS IN THE INTENSIVE CARE UNIT FROM AN OUTBREAK OF CARBAPENEMASE-PRODUCING PSEUDOMONAS

Debbie McDonald[1], *Jen Tomlinson*[1], *David Alexander*[2], *Craig Doerksen*[1], *Lori Foulds*[1], *Jeff McKenzie*[1], *Andrew Walkty*[3], *John Embil*[1]
[1]*Health Sciences Centre Hospital,* [2]*Shared Health – 2Cadham Provincial Laboratory,* [3]*Shared Health – Diagnostic Services Manitoba Health Sciences Center Hospital*

Infection Prevention and Control Lessons Learned in the Operation and Management of Ward Bedpan Washer Disinfectors in the Intensive Care Unit from an Outbreak of Carbapenemase-Producing Pseudomonas aeruginosa

Issue: Operation of ward bedpan washer disinfectors (BWD) using mainly the rim flush cycle instead of the disinfection cycle can lead to development of contamination with strains of antimicrobial resistant bacteria such as carbapenemase-producing Pseudomonas aeruginosa. This can be associated with hospital acquired infections (HAI) that pose great risk to patient safety as there can be limited treatment options available. In 2017, over a 12-week period, carbapenemase-producing Pseudomonas aeruginosa isolates with the same susceptibility profiles were identified in the urine specimens of three patients in a Winnipeg hospital intensive care unit (ICU). The patients were located in close proximity to each other and shared one of the BWD's on the unit. BWD drain sampling revealed two of four ward machines were positive for the outbreak P. aeruginosa isolate. A third BWD became positive for the outbreak P. aeruginosa isolate after its drain overflowed two months later. The fourth BWD had a carbapenemase-producing P. mendocina isolate. BWD machine drain testing was extended to other ICUs at the hospital which identified an additional distinct carbapenemase-producing P. aeruginosa isolate.
Project: Immediate measures were introduced to control the outbreak and prevent further transmission to patients: 1. Bedpans were returned to medical device reprocessing (MDR) after a single use; 2. High-touch areas of the BWD's were disinfected with each use; 3. A disinfecting cycle using alkaline soap and rinse agent was run every eight hours; 3. The exterior surface of the BWD's were disinfected once daily; 4. A multidisciplinary team developed a standardized approach for operation and maintenance of the BWDs based on manufacturer's recommended Instructions for Use and Infection Prevention Control recommendations.
Results: The outbreak was terminated with no further cases. Two documents were drafted: 1. A Standard Operating Procedure (SOP) for operation and maintenance of the BWDs; 2. An SOP for management of drain overflows.
Lessons Learned: Use of ward BWD requires quality control monitoring. The manufacturer's instructions for maintenance and operation of the BWDs and infection prevention control principles should always be strictly followed to avoid creating a source of HAI from resistant bacteria such as carbapenemase-producing P. aeruginosa. Once present, it may not be possible to permanently eliminate carbapenemase-producing P. aeruginosa from the drain of a BWD. Drain overflows may lead to contamination of the BWD drain with carbapenemase-producing P. aeruginosa.

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COLLABORATING FOR CANADIAN BEST PRACTICES FOR INTERMITTENT CATHETERIZATION: IPAC CONSIDERATIONS

Madeleine Ashcroft[1]
[1]*Public Health Ontario*

Issue: Urinary tract infections (UTIs) are the second most common infection, after respiratory infections, with significant impact on healthcare costs, antimicrobial stewardship, and quality of life for sufferers. Indwelling urinary catheters are a major cause of healthcare-associated UTIs. Intermittent catheterization greatly reduces the risk of infection and is widely used for patients with voiding difficulties from a range of medical problems. There are no current Canadian guidelines for intermittent catheterization.
Project: Through the Canadian Network of Nursing Specialties, four associations connected and collaborated to systematically review current literature and create Canadian best practice recommendations for intermittent catheterization, building on the work of the European Association of Urology Nurses 2013 guidelines, and contextualizing current controversies.
Results: Best Practice Recommendations for Intermittent Catheterization are the result of a collaboration between Nurses Specialized in Wound, Ostomy & Continence Canada (NSWOCC), Canadian Nurse Continence Advisors (CNCA), Urology Nurses of Canada (UNC), and Infection Prevention and Control Canada (IPAC Canada). The review panel consisted of specialist nurses' representatives from each of the four collaborating groups.
Lessons Learned: This process has reinforced the value of working together, bringing our individual expertise and the knowledge base of our particular nursing specialties to make recommendations for the evolving Canadian landscape. The document will assist nurses in diverse practice settings to provide evidence-based care to adults requiring intermittent urethral catheterization. IPAC is an essential element of best practices, to reduce risk and enhance success and wellbeing.

ASSESSING THE SUSTAINABILITY OF AN INITIATIVE TO PROMOTE THE USE OF ROUTINE PRACTICES IN AMBULATORY CANCER CARE AREAS AND AMBULATORY CARE AREAS AT ACUTE CARE FACILITIES IN THE PROVINCE OF ALBERTA

Heather Gagnon[1], *Gwyneth Meyers*[1], *Maureen Buchanan-Chell*[1], *Jennifer Happe*[1], *Melody Cordoviz*[1], *Melissa Beck*[1], *Linda Kamhuka*[1], *Ericka Oates*[1]
[1]*Alberta Health Services*

Issue: A horizontal approach that includes a focus on routine practices is fundamental to an Infection Prevention and Control (IPAC) program, and is of increasing importance with global travel and the emergence of various antibiotic-resistant organisms and infectious diseases. In 2016 and 2017, the Alberta Health Services IPAC program implemented two initiatives to promote the application of routine practices in place of contact precautions to manage patients with an antibiotic-resistant organism in ambulatory cancer care areas and ambulatory care areas located at acute care facilities in the province of Alberta.
Project: in 2019, a working group of infection control professionals (ICP) was assembled to design, plan, and implement an evaluation on the sustainability of these initiatives. An interview tool with nine open-ended questions was developed and piloted. ICP performed in-person structured interviews with a minimum of one frontline staff member from a sample of areas involved in the initiatives. Responses from the interviews were coded using a data dictionary, entered into an Excel® 2013 database, and analyzed using descriptive statistics. A focus group interview with ICP was conducted to understand the successes and challenges of the initiatives. Responses were analyzed by two independent reviewers using thematic analysis.
Results: Interviews were performed in 20% (67/313) of areas and included 115 frontline staff. Overall, the use of routine practices was sustained in 42% (28/67) of the areas sampled. In ambulatory cancer care, routine practices were sustained in 67% (8/12) of areas. In ambulatory care, routine practices were sustained in 36% (20/55) of areas. Key themes that emerged from the focus group included: differences in the approach and focus of the initiatives; engagement at various levels that impacted the ability of the ICP to encourage participation in and to implement designed interventions; importance of champions and educators in areas to act as supports for both frontline staff and ICP; consideration for the types of resources developed; and importance of project management to provide clarity on and structure to the initiatives.
Lessons Learned: Sustainability differed between the two initiatives. Explanations for the differences and the degree of sustainability between initiatives were linked to variable levels of engagement with the programs and areas, the complexity of the initiatives in scale and scope, and insufficient supports given this complexity. Lessons learned to apply to any prospective initiatives include: identifying and integrating clear goals and measurable outcomes; engaging leadership at the provincial and local level throughout the initiative; including change management and project management expertise; enhancing support for frontline staff and ICP; considering involvement of patients; and ensuring robust monitoring to support evaluation are in place before proceeding with implementation.

INVESTIGATION OF A CLUSTER OF EARLY-ONSET NEONATAL GBS BACTEREMIA

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Background: Vertical transmission of Group B Streptococcus (GBS) during delivery from colonized mothers to their neonates is a significant concern. Guidelines outline recommendations for prevention of neonatal disease including antenatal screening and administration of intrapartum prophylactic antibiotics. A cluster of four early-onset neonatal GBS bacteremia at a single high-volume birthing centre in August 2019 in Toronto, Ontario led to an investigation to assess for a nosocomial source as well as efforts to reduce GBS sepsis in neonates.
Methods: Over a five-day period in August 2019, all new admissions to the NYGH labour and delivery unit (L&D) were screened for GBS via culture from vaginal/rectal swabs on admission, and screened again within 0-3 hours post-delivery. Concurrently, a retrospective audit of electronic medical health records was conducted for the identified cases, and for all admissions to L&D over a two-week period in July 2019, with a focus on type of delivery, antenatal GBS status (35-37w), administration of intrapartum prophylaxis, and GBS risk factors.
Results: The four neonates with GBS bacteremia were all born full- to late-term (39-41w+6), average ROM to delivery was 12.75hrs (range 3-17hrs). Maternal antenatal (35-37w) GBS status of infected cases were as follows; two negative, one positive, one unknown. Intrapartum GBS prophylaxis was not administered in any of the four cases; chart review indicated one met criteria as per guidelines. Neonates all tested positive in blood culture shortly after birth (mean time = 4.26hrs, range = 0.35-10.65hrs). Three neonates were asymptomatic, while one developed respiratory distress within hours of birth. During the enhanced screening period, 55 patients were screened for GBS. Their antenatal GBS screening at 35-37 weeks was as follows: 46 GBS-negative, seven GBS-positive, two unknowns. On admission, five screened positive, of which two were negative on their antenatal screens. On post-delivery screening, three patients were GBS positive, two of which were negative on admission to L&D. Charts were reviewed for 228 patients admitted to L&D over a two-week period, with 58 caesarean births and 170 vaginal deliveries. Of the vaginal deliveries, 43 patients (25.3%) had a GBS positive antenatal screen, and six (3.5%) were unknown. Eight patients (19.1%) with GBS positive status had no documentation of intrapartum prophylaxis administered.
Conclusion: Adherence to the best practices guidelines for intrapartum prophylaxis was suboptimal with 19% of known positives not receiving prophylaxis. Improvement efforts are underway in this realm. We note that a number of GBS colonized mothers were underserved by this approach (approximately 4% were negative at 35-37 weeks, but positive on admission, and an additional 4% converted from negative to positive in the brief number of hours from presentation to L&D until delivery). This indicates that screening at 35-37 weeks has limitations.

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NATIONAL ADVISORY COMMITTEE ON INFECTION PREVENTION AND CONTROL (NAC-IPC): PROVIDING EXPERT ADVICE ON AN EMERGING RESPIRATORY INFECTION IN CANADA

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Issue: On December 31, 2019, a cluster of pneumonia cases of unknown origin was reported from Wuhan, Hubei Province in China. Ruled out were a number of respiratory pathogens, including human and avian influenza viruses and SARS and MERS coronavirus. Shortly afterward, what is referred to as 2019 Novel Coronavirus (2019-nCoV) was identified as the cause of the outbreak. Spreading to multiple locations within China, laboratory-confirmed cases appeared in other countries, including Canada. Human-to-human transmission, including to healthcare workers (HCWs), was documented. In the absence of effective drugs or vaccines, it was crucial that infection prevention and control (IPC) guidance to prevent and limit transmission of 2019-nCoV in Canadian healthcare facilities be developed urgently.
Project: The Public Health Agency of Canada (PHAC) develops IPC guidelines to provide evidence-based recommendations that complement provincial/territorial efforts in monitoring, preventing, and controlling healthcare-associated infections (HAIs). The National Advisory Committee on Infection Prevention and Control (NAC-IPC) has provided the Government of Canada with expert IPC advice on HAIs, including emerging pathogens, for over 25 years. An external advisory body, it feeds into the federal-provincial-territorial (FPT) response structure for biological events. Comprising members with various expertise, including infectious disease, medical microbiology and IPC, it supports development, dissemination, evaluation, and implementation of IPC guidelines. PHAC-produced guidelines are usually developed by conducting rigorous and comprehensive systematic reviews, with evidence grading where applicable; this process can be lengthy. The rapid spread of 2019-nCoV necessitated a timely response; thus, a targeted environmental scan of published material from reputable sources was conducted. The NAC-IPC was consulted for their technical IPC expertise.
Results: Interim IPC recommendations for the emerging respiratory infection were developed, resulting in the release of the Infection Prevention and Control for Novel Coronavirus (2019-nCoV): Interim Guidance for Acute Healthcare Settings amid an evolving situation. Subject to change as new information emerged, recommendations were informed by expert interpretation of available scientific evidence and collective expert opinion where evidence was as yet unknown/inconclusive. The interim guideline was circulated via various channels for accessibility by HCWs.
Lesson Learned: By supporting PHAC with development of national evidence-based guidelines, the NAC-IPC plays a critical federal role in managing HAIs and emerging pathogens. Its work informs FPT public health networks, facilitating a pan-Canadian approach to responding to public health emergencies and maintaining safe healthcare delivery.

THE POWER OF A TWEET: HOW AN INFECTION PREVENTION AND CONTROL (IPAC) DEPARTMENT'S SOCIAL MEDIA ACCOUNT ENGAGES AND INCREASES AWARENESS

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Issue: Social media is an ever-expanding tool of knowledge sharing and information transfer. Infection prevention and control (IPAC) is a field which is strengthened by knowledge exchange and promotion of best practices. The use of social media to promote the field of IPAC and provide education by a Canadian hospital has been seldom attempted yet has enormous potential.
Project: In early 2019, the IPAC department started a twitter account with the intention of bringing awareness to IPAC measures and situations occurring in the hospital, as well as to increase engagement in the broader health community. Two IPAC professionals managed the twitter account and updated it with timely information about relevant IPAC topics. A dissemination strategy included highlighting events, a focus on key IPAC messages, as well as a daily schedule of themes for different days of the week such as meet your IPAC team Mondays, twinning Tuesdays and throwback Thursdays. There was also engagement of external professionals in the field in order to spark discussion and build awareness of the IPAC department.
Results: Over the course of one year, the account has grown its following and has over 320 followers including Canadian IPAC professionals, and international followers. From a Canadian perspective, the account has the largest following for an IPAC department. The account has a follower reach from numerous countries including United States, Saudi Arabia, United Kingdom, Russia, Spain, and India. On the date of confirmation of the first case of the 2019 Novel Coronavirus in Canada, a tweet using emojis to illustrate the proper donning and doffing sequence generated immense engagement with over 27,000 views, 140 'retweets', 210 'likes', and spawned 140 profile visits. This tweet brought educational value and a timely refresher in light of the novel coronavirus as evidenced by feedback received from as far away as New Zealand. Furthermore, the account provided consistent and timely messaging throughout the early stages of the novel coronavirus outbreak and was used as a tool to disseminate accurate updates to hospital staff.
Lesson Learned: The outcome of this social media experiment is a platform for engagement and knowledge exchange in the field of infectious diseases, infection control, and nursing. The use of timely and simple messaging enabled an increase in awareness of various IPAC topics. Communicating on a social media platform should be practiced cautiously and with particular focus on accurate evidence-based information is crucial in keeping an account reliable, technically sound, and trustworthy. Social media platforms, such as Twitter, are increasingly becoming popular sources of new information and practice sharing in the field of IPAC topics can be effectively promoted to a broader audience.

BRINGING ANTIMICROBIAL STEWARDSHIP TECHNOLOGY TO A SMALL NORTHWESTERN ONTARIO HOSPITAL

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Project: The Antimicrobial Stewardship committee put forth a recommendation to purchase an already established app that could be tailored to our hospital. It took approximately a year communicating with the company to the implementation date.
Issue: Getting medical staff to utilize antibiogram data/antimicrobial guidelines and improve antimicrobial prescribing practice.
Project: The Antimicrobial Stewardship committee put forth a recommendation to purchase an already established app that could be tailored to our hospital. It took approximately a year communicating with the company to the implementation date. The time-consuming processes were:

- Financial approval from the hospital
- Establishing guidelines
- Entering the guidelines/antimicrobials and pathogenic information
- Familiarizing ourselves with the app

Results:
Our 69-bed hospital has 68 users. They are divided (highest to lowest):

By Location:
1. LWDH
2. Kenora community of practice
3. Other community of practice
4. Other hospital
5. Other

By Practitioner:
1. Physician
2. Pharmacist
3. Other Health Care provider
4. Medical Student
5. Other Non-healthcare provider
6. Nurse
7. Resident
8. Surgeon
9. Physician Assistant
10. Nurse Practitioner
11. Locum Physician
12. Other student

We are also able to see what antimicrobials and pathogens are most accessed as of January (highest to lowest):

Antimicrobials:
Ceftriaxone
Penicillin G
Cefazolin
Piperacillin-Tazobactam
Cephalexin
Vancomycin
Septra
Amoxicillin
Doxycycline
Ampicillin

Pathogens:
Streptococcus, Group B
Staphylococcus Aureus (MRSA)
Escherichia Coli
Streptococcus pyogenes, Group A
Staphylococcus Aureus
ESBL Organisms
Staphylococcus Aureus (MSSA)
Anaerobic gram + cocci
Streptococcus pneumoniae
Enterobacter cloacae group

Lessons Learned:

- Now that we have implemented the app, we have realized there is no formal way of determining the impact it has had on antimicrobial usage in the hospital;
- We will be able to target non-users for their compliance;
- We will be able to develop educational programs (grand rounds) based on the most accessed pathogenic information;
- The app was really well received both internal and external to the organization. There was a handful of locum physicians that have used it at other facilities were very excited to know that we have access to this information at our hospital from their own personal phone/tablet, etc.;
- Antimicrobial stewardship is incredibly important and there is currently no funding in place at our hospital. This made it challenging to perform the regular duties of our jobs and reach our goal of implementation;
- ASP data such as compliance with empiric treatment guidelines, defined daily dose, and total days of therapy (length of therapy) will still need to be determined by personal review of pharmacy data.

ANTIMICROBIAL RESISTANT ORGANISMS IN CANADIAN LONG-TERM CARE FACILITIES: RESULTS FROM A NATIONAL POINT PREVALENCE SURVEY

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Background: Infections caused by antimicrobial resistant organisms (ARO) are a significant issue in long-term care facilities (LTCF), where there are limited data on prevalence and practices related to AROs. We sought to examine ARO screening practices and infections reported by Canadian LTCF as part of a national cross-sectional survey.

Methods: From March to May 2019, LTCF chose one 24-hour period to assess the burden of bacterial infections and completed questionnaires on residents who had an infection on the selected day. LTCF also completed a questionnaire about their site, including practices related to ARO screening. Prevalence of infection and the percentage of residents with ARO were calculated using the total number of residents present in all participating LTCF on the survey day. ARO screening practices and infection prevention and control resources were examined by region and type of facility.

Results: Data from 13,635 residents in 133 LTCF were collected. The median number of LTC beds per site was 79 (IQR: 60-140), and 63% of residents were female. More LTCF were in Western (45.1%) compared to Central (35.3%) and Eastern Canada (19.5%); 58.6% were public facilities and 18.8% were private. The proportion of LTCF that screened residents varied by ARO: *Clostridioides difficile* (91.0%), VRE (61.7%) CPO (46.6%), ESBL (24.1%). LTCF in Western Canada were less likely to screen residents for MRSA (48.3%) or VRE (28.3%) compared to LTCF in other regions (≥89%, $p<0.0001$). At least 50% of LTCF had access to an infection control professional; this increased from 40% in smallest LTCF (<50 beds) to 69% in facilities with ≥150 beds, and was greater in public (63%) vs private (16%) sites. Overall, 3.3% of residents had an infection on the prevalence day; urinary tract and skin/soft tissue infections comprised 68% of all reported infections. Prevalence of ARO infection was 0.41%; this was significantly greater in private (1.06%) vs public (0.25%) sites ($p<0.0001$). MRSA was most commonly reported (4.4% of residents were MRSA colonized and 0.3% had MRSA infection). Among residents with infection, those ARO colonized within the past 12 months were more likely to have an ARO infection compared to those not ARO colonized (OR 28.6 [95% CI: 13.9, 59.0]). A greater proportion of residents with ARO infection were hospitalized in the past 12 months (51.7% vs 38.8% of residents with non-ARO infection).

Conclusion: Our survey found a measurable burden of ARO and variable screening practices, demonstrating the importance of surveillance in LTCF. Infection control professionals were least accessible in private facilities where ARO prevalence was greatest. In addition to increased vigilance for risk factors associated with ARO infection such as previous ARO colonization and hospitalization, capacity building for infection prevention and control are critical components in curbing the spread of antimicrobial resistance in LTCF.

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