Chapter 24
Saskatchewan Health Authority—Preventing and Controlling Hospital-acquired Infections in the Regina General Hospital and Pasqua Hospital

1.0 Main Points

This chapter sets out the results of our audit of the processes that the Saskatchewan Health Authority used to prevent and control hospital-acquired infections in the Regina General Hospital and Pasqua Hospital.

Infections acquired in hospitals can extend a patient's hospital stay and may lead to increased complications and costs for treatments. The Saskatchewan Health Authority is responsible for keeping patients safe.

For the 12-month period ended August 31, 2018, the Saskatchewan Health Authority had, other than the following, effective processes to prevent and control hospital-acquired infections in the Regina General Hospital and Pasqua Hospital. The Authority needs to:

- Use external observers to conduct regular blind hand hygiene compliance audits and actively monitor the patient-care units with lower than acceptable hand hygiene compliance rates. This would give the Authority better information about the use of hand hygiene practices. It would also help the Authority take sufficient and timely action to improve hand hygiene practices of staff, and in turn reduce the risk of hospital-acquired infections.

- Provide staff responsible for patient care with formal periodic refresher training on infection prevention and control practices. Periodic training would reinforce to staff the importance of strong infection prevention and control practices. This, in turn, can help reduce inappropriate practices that increase the risk of transmitting an infection to patients or staff.

- Regularly give senior management a written analysis of emerging risks and causes based on trends of hospital-acquired infections. This would help the Authority identify hospitals and units therein with higher-than-normal rates of hospital-acquired infections and help them improve their practices.

2.0 Introduction

The Provincial Health Authority Act makes the Authority responsible for planning, organizing, delivering, and evaluating the health services of the province. *The Provincial Health Authority Administration Regulations* specify that health services include disease and injury prevention services.

Regina General Hospital and Pasqua Hospital are the two major hospitals providing health care services to people of southern Saskatchewan. For the year ending March 31, 2018,

38,293 (2016-17: 34,097) people were admitted to these two hospitals.[1] At March 2018, these hospitals employed about 4,400 full-time equivalent staff.

2.1 Hospital-acquired Infections

A hospital-acquired infection is an infection that a patient acquires while in a hospital that was not present or incubating on admission.[2] Examples of common hospital-acquired infections include infections caused by organisms such as Clostridium difficile (CDI), Methicillin-resistant staphylococcus aureus (MRSA), and Vancomycin-resistant enterococcus (VRE).[3,4,5] These infections are usually spread through contact with someone who carries the disease, an infected person, or with a contaminated surface.[6]

In Canada, between 3% and 20% of hospitalized patients acquire an infection after admittance to hospital.[7] In the most serious cases, hospital-acquired infections can cause or contribute to the death of a patient. Hospital-acquired infections contribute to approximately one-third of unexpected in hospital deaths.[8] The Canadian Patient Safety Institute estimates that about 8,000 Canadians die annually from hospital-acquired infections.[9]

Hospital-acquired infections can extend a patient's hospital stay and may lead to increased complications and costs for treatment. For example, MRSA infected patients require on average 26 days of isolation, special control measures, and expensive treatments.[10] Hospital-acquired infections add $39 million to $52 million annually to healthcare costs in Canada.[11]

Infection Prevention and Control Canada suggests that up to 70% of hospital-acquired infections are preventable.[12,13] An effective infection prevention and control program can reduce the burden associated with hospital-acquired infections, reduce length of hospital stay, lessen antimicrobial resistance, and lower costs related to treatment of infections.

3.0 Audit Conclusion

We concluded that for the 12-month period ended August 31, 2018, the Saskatchewan Health Authority had, other than the following areas, effective processes to prevent and control hospital-acquired infections in the Regina General Hospital and Pasqua Hospital.

[1] Information provided by Saskatchewan Health Authority.
[2] World Health Organization, *Health care without avoidable infections*, *The critical role of infection prevention and control*, (2016), p. 4.
[3] Clostridium difficile is a bacterial spore that causes irritation in the bowel leading to severe cramps and diarrhea.
[4] Methicillin-resistant staphylococcus aureus is a bacterium resistant to common antibiotics and affects the heart, lungs, bones, joints, and/or bloodstream.
[5] Vancomycin-resistant enterococcus is a bacterium resistant to common antibiotics and causes severe urinary tract infections.
[6] www.patientsafetyinstitute.ca/en/Topic/Pages/Healthcare-Associated-Infections-(HAI).aspx (4 April 2018).
[7] https://ipac-canada.org/photos/custom/pdf/IPAC_PROGRAM_STANDARD_2016.pdf (30 May 2018).
[8] Ibid.
[9] www.patientsafetyinstitute.ca/en/Topic/Pages/Healthcare-Associated-Infections-(HAI).aspx (4 April 2018).
[10] Public Health Agency of Canada, *Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Healthcare Settings*, (2013), www.canada.ca/en/public-health/services/publications/diseases-conditions/routine-practices-precautions-healthcare-associated-infections.html (04 April 2018).
[11] https://ipac-canada.org/photos/custom/pdf/IPAC_PROGRAM_STANDARD_2016.pdf (30 May 2018).
[12] Infection Prevention and Control Canada, *Infection Prevention and Control (IPAC) Program Standard*, (2016), p. 16.
[13] Infection Prevention and Control Canada is a multidisciplinary non-profit organization of professionals engaged in prevention and control of infections. They also set standards, and consult with other standard setters (e.g., Public Health Agency of Canada and the Canadian Standards Association).

The Authority needs to:

- **Conduct external and regular blind hand hygiene compliance audits**
- **Provide staff responsible for patient care with formal periodic refresher training on infection prevention and control practices**
- **Actively monitor actions taken by Regina hospitals' patient-care units with lower than acceptable hand hygiene compliance rates**
- **Regularly give senior management a written analysis of emerging risks and causes based on trends of hospital-acquired infections**

Figure 1—Audit Objective, Criteria, and Approach

Audit Objective: to assess whether the Saskatchewan Health Authority had effective processes, for the 12-month period ending August 31, 2018, to prevent and control hospital-acquired infections in the Regina General Hospital and Pasqua Hospital.

Audit Criteria:

Processes to:

1. Plan to manage hospital-acquired infections
   - 1.1 Plan to meet national standards and requirements
   - 1.2 Develop a strategy to prevent and control infections
   - 1.3 Clarify accountability for infection prevention and control
   - 1.4 Provide resources to prevent and control infections (e.g., guidance, supplies, staff)
   - 1.5 Establish a communication strategy
2. Monitor compliance with infection prevention and control program
   - 2.1 Monitor infection control practices regularly
   - 2.2 Use a centralized system to collect accurate data to monitor infections and control practices
   - 2.3 Analyze data to identify emerging risks, trends, and areas for action
3. Report results for continuous improvement
   - 3.1 Report and contain infections promptly
   - 3.2 Report infection prevention and control program analysis and results to senior management
   - 3.3 Inform public about serious infection risks and trends

Audit Approach:

To conduct this audit, we followed the standards for assurance engagements published in the *CPA Canada Handbook – Assurance* (CSAE 3001). To evaluate the Saskatchewan Health Authority's processes, we used the above criteria based on our related work, reviews of literature including reports of other auditors, and consultations with management. The Authority's management agreed with the above criteria.

We examined the Authority's policies, procedures, and records that relate to processes to prevent and control hospital-acquired infections. We observed practices in 15 patient-care units at Regina General Hospital and Pasqua Hospital, tested accuracy of reporting, and reviewed outbreak communications to assess operating effectiveness of the Authority's processes to prevent and control hospital-acquired infections in Regina General Hospital and Pasqua Hospital.

4.0 Key Findings and Recommendations

In this section, the Infection Prevention and Control Department refers to the department located in Regina that was part of the former Regina Qu'Appelle Health Region. At August 2018, the Authority had similar departments in other locations.

4.1 Strategic Priorities for Infection Prevention and Control Set Out

The Authority has clear strategic priorities for preventing and controlling infections for the Regina General and Pasqua hospitals. These are generally consistent with the strategic direction of the Authority.

As shown in **Figure 2**, the Infection Prevention and Control Program *Strategic Directions Report* (2017-18), prepared by the former Regina Qu'Appelle Health Region, includes six strategic priorities. The priorities have the aim of improving the safety and quality of patient care by preventing and controlling the spread of infectious diseases within the former Regina Qu'Appelle region. The *Strategic Directions Report* also sets planned actions to achieve the strategic priorities.

The Report was last updated in December 2017. No further updates occurred as of August 2018 in part due to the other priorities resulting from the 2017 amalgamation of the health authorities into the Saskatchewan Health Authority.

Figure 2—Strategic Priorities for the Regional Infection Prevention and Control Program

1. Infection Prevention and Control (e.g., the use of routine practices for appropriate hand hygiene and sterilization of instruments and equipment)
2. Surveillance (e.g., participate in routine surveillance for hospital-acquired infections including CDI, MRSA, VRE; outbreak detection)
3. Policy Development (e.g., development of definitions and protocols to allow standardized surveillance of infectious diseases)
4. Education and Promotion (e.g., provide infection prevention and control orientation to all new staff; promote the use of routine precautions and hand hygiene among staff, visitors, and patients)
5. Consultation (e.g., involved in consulting in key areas of the healthcare facility such as nursing, housekeeping, laundry services, construction and maintenance activities)
6. Special Projects (e.g., hand hygiene, unit/facility audits)

Source: Saskatchewan Health Authority – Regina Infection Prevention and Control Program, *Strategic Directions Report*.

The Authority's Infection Prevention and Control Department (Regina) is responsible for carrying out the strategic priorities set out in the Report for the Regina hospitals.

Hospital unit managers of various units caring for patients within each Regina hospital are responsible for the health and safety of the units' staff and patients, as well as ensuring that all unit staff follow health and safety requirements (e.g., safe use and disposal of sharps). Unit managers are also responsible for determining the training needs of their staff. The Regina General and Pasqua hospitals have 67 patient-care units.

The Department, along with unit managers in the Regina General and Pasqua hospitals, continue to use the Report to direct their infection prevention and control priorities.

The Department carries out the infection prevention and control strategic priorities by:

- Developing infection prevention and control policies (e.g., hand hygiene, cleaning requirements, human waste management) and surveillance protocols.
- Undertaking active surveillance to identify trends and detect outbreaks (e.g., for hospital-acquired infections such as Vancomycin-resistant enterococcus infection, and Clostridium difficile).

- Providing orientation training to new employees to convey responsibilities to comply with infection prevention and control practices.
- Providing support to hospital units upon request and as particular issues arise.
- Consulting with different areas of hospitals (e.g., housekeeping, nursing, facilities management) through their membership in the Regional Infections Prevention and Control Operations Group. The purpose of the Group is to co-ordinate infection prevention and control practices for the hospitals.[14]

4.2 Dedicated Infection Prevention and Control Staff Keep Practices Current

The Infection Prevention and Control Department's staff are dedicated to prevent and control infections within the Regina and Pasqua hospitals, and have suitable education and training.

As of August 2018, the Department (Regina) consisted of eight full-time positions. This included an epidemiologist, two medical microbiologists, five infection control practitioners, a Director of the Department, an administrative assistant, and a project co-ordinator.

The epidemiologist and microbiologists are medical professionals with related university degrees (e.g., Masters of Public Health, Masters of Science).

The Authority requires infection control practitioners to have a related infection prevention and control designation (e.g., Certification in Infection Control, Certificate of Infection Prevention and Control during Construction, Renovation and Maintenance of Health Care Facilities, or Certificate of Medical Device Reprocessing Technician). We found that all five infection practitioners have their current related infection prevention and control designations.

To keep current, the Department's staff maintain memberships in Infection Prevention and Control Canada and the Saskatchewan Professionals in Infection Control.[15] In addition to memberships, the Department's staff attends, and, at times, presents at infection prevention and control conferences. For example, infection control practitioners attended the Infection Prevention and Control Canada national conference in June 2018.

4.3 Policies and Procedures Align with National Standards

The Infection Prevention and Control Department's policies and procedures align with national infection control standards, including Accreditation Canada standards.[16] The

[14] The Group is comprised of representatives from various areas such as nursing staff from various units, housekeeping staff, facilities management, patients, a medical microbiologist, emergency health services, infection control practitioners, and Public Health Services.
[15] Saskatchewan Professionals in Infection Control is part of Infection Prevention and Control Canada that provides opportunities for networking, education, and collaboration for infection control practitioners in Saskatchewan.
[16] Accreditation Canada assesses and approves health care organizations to provide services to the public. Health Services Organization, which branched out from Accreditation Canada in February 2017, sets national standards.

Department has about 30 procedures related to infection prevention and control for acute care.

As of August 2018, the Department continued to use the policies and procedures of the former Regina Qu'Appelle Health Region. Management indicated that the Authority plans to establish provincial infection control policies and procedures in the future.

The Department's policies and procedures address the following three key aspects of infection prevention and control: personal hygiene (e.g., hand washing), equipment cleaning, and general cleaning (e.g., room, hallway, laundry services).

The Department keeps the policies and procedures up to date. It reviews policies and procedures on a cyclical basis every three years. For example, in 2017-18, the Department reviewed 5 policies and procedures, and plans to review 11 in 2018-19.

It keeps staff informed of the policies. It posts all the infection control policies and procedures on its internal website. We found these policies and procedures understandable and readily accessible.

When a policy or procedure change occurs, the Department notifies the hospital unit managers impacted by the change. The Executive Sponsorship Group of the former Regina Qu'Appelle Health Region approved all policy or work standard changes.[17] It is the unit manager's responsibility to update the unit's staff of the changes.

For five policies and procedures we tested, all aligned with national infection control standards and met Accreditation Canada requirements. We also found that all five policies and procedures were current (i.e., reviewed and updated within the last three years).

In addition, each Regina hospital has standard procedures to inform patients who acquire an infection in the hospital.[18] Patients receive notification and education when they contract an infection while in the hospital. Each hospital keeps available and uses signs for patients on additional precautions to alert patients, staff, and visitors what to do (e.g., wash hands, wear an isolation gown) before entering a room on additional precaution.

In our visit of 15 units across the two hospitals, we observed rooms that required signage for contact precautions and airborne precautions had the appropriate advisory signage for patients, staff, and visitors. For those rooms, we also observed that the hospital had made personal protective equipment readily available by the entrance to the rooms.

4.4 Inpatient Rooms Structured Adequately to Prevent and Control Infections

The Authority meets international standards for isolation space in its Regina hospitals.

International standards suggest at least 20% of the total bed complement in inpatient units across a healthcare facility be single rooms.[19] Single rooms typically allow for the isolation of patients that spread an infection through touch. Medical staff and visitors

[17] The Executive Sponsorship Group included the Medical Health Officer, the medical microbiologist, physician representatives, patient representatives, and several executive directors.
[18] The Department also notifies the person whose lab results show the presence of bacterial infection even if the infected person may not have signs or symptoms of infection.
[19] http://healthfacilityguidelines.com/Guidelines/ViewPDF/iHFG/iHFG_part_d_isolation_rooms (04 September 2018).

typically are to use personal protective equipment (e.g., gloves and gowns) when entering these rooms.

We found, at August 2018, the Regina General and Pasqua hospitals exceeded single room requirements by having approximately 40% of all inpatient beds as single rooms.

International standards indicate that healthcare facilities should provide at least one room with negative air pressure per 100 inpatient beds to protect patient and staff from airborne transmissions (i.e., 1% of inpatient beds).[20]

We found, at August 2018, the Regina General and Pasqua hospitals exceeded the negative-air pressure requirements by having a combined 60 rooms for their 676 inpatient beds (i.e., 8.9% of inpatient beds).

4.5 Formal Education Updates Required

The Authority gives new staff that provide patient care in the Regina General and Pasqua hospitals infection prevention and control orientation training. However, contrary to good practices, it does not provide them with formal periodic refresher training on infection prevention and control practices.

Infection and Prevention Control Canada recommends providing staff with education on infection prevention and control at least annually (e.g., webinars, classroom training).

New staff at the Regina General and Pasqua hospitals receive about a one-hour orientation shortly after they start work that sufficiently covers key aspects of infection prevention and control. Orientation includes an overview of hospital-acquired infections, ways of transmission, and practices set out in the work standards (e.g., hand hygiene, handling sharps, using personal protective equipment).

The Authority does not require staff at the Regina General and Pasqua hospitals to receive refresher training on infection prevention and control. It has not identified what education hospital staff (e.g., cleaning staff, nursing staff) should receive routinely about preventing and controlling infections.

Rather individual unit managers may ask on an ad hoc basis the Infection and Prevention Control Department to give their staff training (e.g., single use of gloves, hand hygiene). For example, staff of the Department may participate in a unit's wall walk, or give a specific training session to certain staff.[21]

The Department tracked who requested education, type of education, when and who gave the education, and number of participants up to December 2017. For example, during the three-month period ending December 2017, the Department provided two sessions on hand hygiene. It no longer tracks the education provided. Therefore, the Department does not analyze or report on the nature and extent of training it provided each year.

Periodic refresher training helps keep staff up-to-date, and provides an opportunity to reinforce the importance of key activities to prevent and control hospital-acquired

[20] A negative pressure room is an isolation technique used to prevent cross-contaminations from room to room. The ventilation system generates negative pressure to allow air to flow into the isolation room but not escape from the room.
[21] A wall walk is a short, stand-up meeting that brings unit managers and staff together at the same time each day or week. The manager reviews the team's progress towards achieving regional or unit targets displayed on the unit's visibility wall.

infections. Not having periodic refresher training can lead to inappropriate practices that may increase the risk of infection transmission, and compromise the wellness and health of patients and staff.

1. **We recommend that the Saskatchewan Health Authority give hospital staff, responsible for patient care, formal training updates on infection prevention and control practices at least annually.**

4.6 Alternative Methods of Monitoring Staff Compliance with Practices Needed

While the Authority routinely monitors staff's compliance with established infection prevention and control practices, it needs to do more.

The Authority monitors staff at Regina hospitals' compliance with established infection prevention and control practices in several ways. Its key monitoring activities are:

- Daily environmental services cleaning audits to assess compliance with general cleaning practices
- Monthly and periodic audits at patient-care units to monitor staff's compliance with the hand hygiene compliance policy
- Annual general cleaning audits at units to assess compliance with general cleaning practices and the patient service environment

The following further discusses each key monitoring activity.

Environmental Services Cleaning Audits Completed Regularly and Deficiencies Resolved Quickly

Management in environmental services complete regular audits to determine whether staff follow established cleaning standards.

The Environmental Services unit for the Regina hospitals (i.e., housekeeping) train its staff at the beginning of their employment to clean different hospital environments. Unit supervisors complete a daily visual audit of a room to determine whether staff cleaned the room appropriately.

Unit supervisors also complete random fluorescent ink spots audits (approximately 25 per month). Before the shift, supervisors mark with invisible ink high-touch areas (e.g., sink, door handles, etc.) that require a certain amount of pressure and cleaning agents to remove the ink. After cleaning, supervisors check the spots to see if adequate cleaning occurred.

We observed that the Environmental Services unit keeps track of its audits completed and related results. We noted that for identified deficiencies in cleaning, the unit addresses them immediately.

More Consistent Hand-hygiene Compliance Audits Needed

The compliance rate of staff of Regina hospitals with the hand-hygiene policy was consistently below their target of 100%. Contrary to Ministry of Health guidelines, the Regina hospitals do not complete blind direct observation audits of hand hygiene on a regular basis, or use staff external to the unit for direct observation audits. In addition, not all units at the Regina General and Pasqua hospitals report the results of their direct observation audits of hand hygiene to the Department on a monthly basis as expected.

Hand hygiene is one of the main ways to prevent and control the spread of infections. Audits determine whether staff use appropriate hand hygiene practices. In blind direct observation audits (blind audits), staff observe a unit staff's compliance with the hand hygiene policy when they are unaware of being observed. In direct observation audits, staff openly observe other staff's compliance with the hand hygiene policy.

Consistent with good practice, the Ministry of Health guidelines for hand hygiene indicate staff external to a unit/facility should observe compliance with hand hygiene to decrease the potential for bias. In addition, the Ministry guidelines suggest results of blind audits are more representative of true hand hygiene compliance than direct observation audits.[22]

Each month, the Authority expects a staff member from each patient-care unit in its two Regina hospitals to conduct direct observation hand hygiene audits to openly assess fellow staff's compliance with the hand hygiene policy (see **Figure 3**), and submit results to the Infection Prevention and Control Department (Regina).

Each month, the Department calculates the hand-hygiene compliance rate of these direct observation audits for each unit and hospital. It reports rates to the unit managers, and posts them on the internal and external website each quarter. It also shares the hand-hygiene compliance results with senior management quarterly.

Figure 3—Hand-hygiene Compliance Policy

Staff are expected to perform hand hygiene:

- Before entering or leaving any facility or unit
- Before client/client environment (e.g. client room, equipment in client room) contact
- After client/client environment contact
- Before aseptic task (e.g., sterilization of equipment)
- After body fluid exposure risk

Source: Hand Hygiene Compliance Policy.

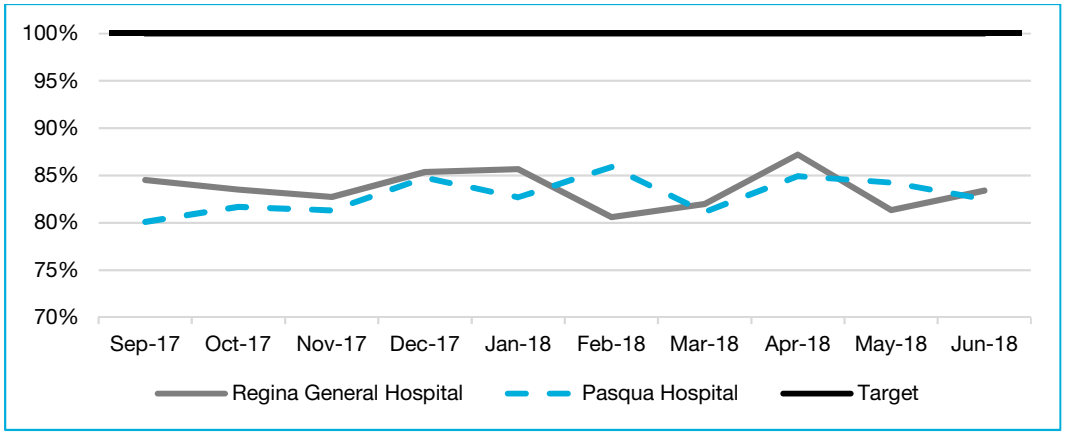
With respect to direct observation audits of hand hygiene at the Regina hospitals, we found:

- Ten of 67 units did not always report the monthly audit results for the 12-month period ended August 31, 2018. For example, one unit in the Pasqua Hospital did not submit four monthly hand-hygiene audit results for the 10-month period from September 2017 to June 2018. Furthermore, staff carrying out these audits observed fellow staff; that is, they were not external to the unit as the Ministry guidelines suggest.

[22] Government of Saskatchewan, *Saskatchewan Infection Control Program – Hand Hygiene Working Group, Infection Prevention and Control Recommendations for Hand Hygiene in all Healthcare Settings*, (2017), p. 3.

- The average compliance rate from September 2017 to June 2018 in both Regina hospitals fluctuated between 80% and 87% (see **Figure 4**). This is consistently below their target rate of 100%.

Figure 4—Average Direct Observation Audit Compliance Rate of Hand Hygiene in Regina Hospitals



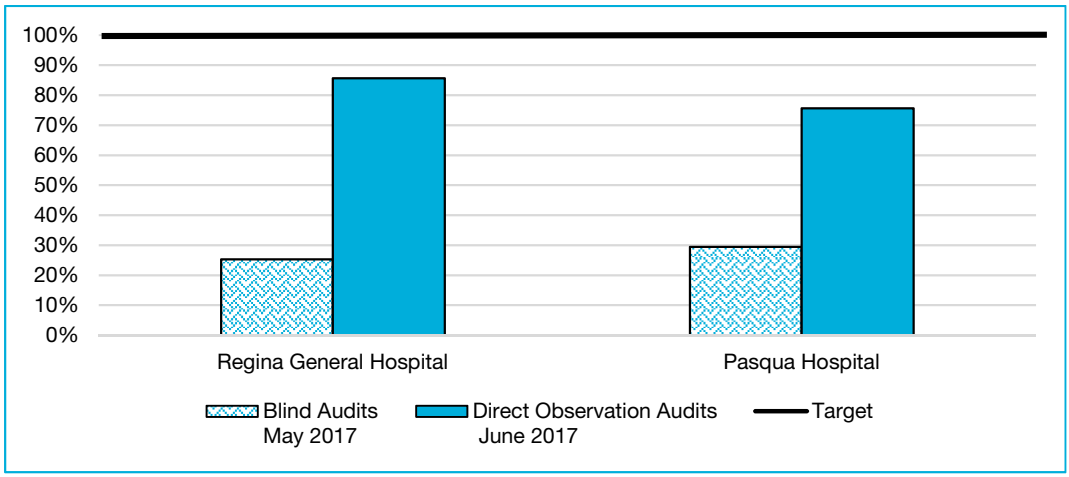
Source: Former Regina Qu'Appelle Health Region Hand Hygiene Regional Reports.

With respect to blind audits of hand hygiene at the Regina hospitals, we found:

- The Department did one series of blind audits (when people are not aware that they are observed) in May 2017. The Department conducted 16 hand-hygiene blind audits in patient-care units throughout the two hospitals using the same criteria and the same extent as direct observation audits (when people may know that they are observed).

- As shown in **Figure 5**, the compliance rate for blind audits at the Regina hospitals were significantly lower than rates of the direct observation audits for a similar period (some units had 60-70% difference in compliance rates between these two types of audits, and where the observer was external to the unit). This difference suggests actual compliance rates for hand hygiene may be significantly lower than that reported each month.

Figure 5—Comparison of Compliance Rates of Hand Hygiene Direct Observation Audits and Blind Audits in Regina General Hospital and Pasqua Hospital[A]



Source: The Infection Prevention and Control Department records.
[A] Direct observation audits were done in June 2017. The May 2017 blind audits were reported in June 2017.

Not routinely conducting blind audits of hand hygiene or using staff external to units to observe compliance with hand hygiene practices increases the risk that compliance rates may not be representative of day-to-day hand-hygiene practices. Not having accurate compliance rates may increase the risk of the Authority not taking sufficient or timely action to improve hand hygiene practices of staff. This in turn places patients and staff at greater risk of hospital-acquired infections.

2. **We recommend that the Saskatchewan Health Authority use external observers to conduct regular blind direct observation hand-hygiene compliance audits in its hospitals.**

General Cleaning Practices Not Always Followed

The Infection Prevention and Control Department (Regina) adequately evaluates compliance of each patient-care unit with general cleaning practices on an annual basis. Staff do not always follow good general cleaning practices.

Starting the spring 2016, the Department conducted annual general cleaning compliance audits of each patient-care unit. In these audits, the Department evaluated a unit's general cleaning practices, and the patient service environment (e.g., nursing station, medical preparation areas, patient rooms, clean and dirty utility rooms) using a nationally recognized audit tool.[23] For example, it assessed whether:

- Waste containers are overfilled
- Clean and soiled linen are transported and stored separately
- Alcohol-based hand rub is at the nursing station
- Areas/rooms have a clean, orderly appearance with minimal supplies (e.g., no stockpiling)
- Personal protective equipment is available and accessible in appropriate sizes at point-of-care
- Clean and sterile supplies are protected from dust, dampness, or water sources

The Department gave unit managers the results of their audit shortly after its completion to enable unit managers to address identified deficiencies as quickly as possible. The Department typically followed up with units with significant identified deficiencies three months after the audit. Significant deficiencies include no alcohol-based hand rub near nursing stations, or no schedule for cleaning the hallway cart. In 2017-18, the Department identified significant deficiencies in only a few units.

For 15 units in the two hospitals, we observed staff did not always follow good practice for general cleaning. For example, in one unit, we found clean linen carts were not always covered; and in five other units some carts were in close proximity to garbage cans and soiled linen. Our observations suggest additional reminders to staff to follow good practices for infection prevention and control may be warranted. See **Recommendation 1**

[23] Infection Prevention and Control Canada, *Infection prevention and control audit for Client/Patient/Resident Service unit environment*. An annual audit is considered to be a good practice.

about giving hospital staff formal training updates on infection prevention and control practices. Poor cleaning practices, such as those we observed, increase the risk of contamination and infections.

4.7 Active Oversight of Hand-hygiene Corrective Action Plans Needed to Improve Compliance

The Authority does not actively oversee the implementation of hand-hygiene corrective action plans for units with low compliance rates to ensure their staff improve hand-hygiene practices. Not all patient-care unit managers are doing enough to improve hand-hygiene practices.

Job descriptions of patient-care unit managers state that they are to ensure their staff follow established policies and procedures; these include infection control policies and procedures.

Management expects unit managers to post monthly hand-hygiene compliance rates on the unit's visibility wall to remind staff of the importance of hand hygiene. During daily wall walks, managers are to remind staff about hand hygiene, and reinforce compliance. Also, when compliance rates are low, unit managers are to develop and post corrective action plans on their unit walls. The correction action plans are to set out:

- Issues identified
- Root causes
- Key actions
- Person responsible for key actions
- Expected completion date

For 4 of the 15 patient-care units we observed, the hand-hygiene compliance rates were not posted on the visibility wall. The average compliance rates of these units between April to June 2018 ranged from 43% to 87%.

For 4 of the 8 patient-care units we observed with compliance rates below 90% in August 2018, none of them had developed corrective action plans. Between July 1 and September 30, 2018, the compliance rate among the 4 units ranged from a minimum of 33% to a maximum of 93%, with an average of 65%.

Without posting hand-hygiene audit results and corrective action plans, unit managers may not actively reinforce the importance of good hand hygiene practices, or take sufficient steps to improve hand-hygiene activities of staff in their unit.

We found that the Authority was not actively holding patient-care units accountable for the results of hand-hygiene audits. We noted that the Infection Prevention and Control Department did not have authority to ask units whose compliance rates remained below target over a longer period to make improvements. We further noted hospital management was not actively overseeing whether their units (with compliance rates not meeting target)

developed or implemented corrective action plans, or improved hand-hygiene practices as expected.

As shown in **Figure 4**, the reported hand-hygiene compliance rates of the Regina hospitals have remained well below the 100% target for the past three years (average compliance rates for both hospitals fluctuated between 80% and 87%). We note hand-hygiene compliance targets across jurisdictions vary. For example, Manitoba's Winnipeg Regional Health Authority had a 2017-18 target of 100% and a goal of 80% for hand-hygiene compliance rates with an actual rate of 68% at the end of quarter four in 2017-18.[24] We also note that Alberta Health Authority had a 2017-18 target of 90% with an actual 2017-18 rate of 85%.[25]

As previously noted, given day-to-day hand-hygiene practices may be worse than the reported hand-hygiene compliance rates, the use of an interim target rate (goal) is a way to help focus resources on units requiring greater attention or monitoring.

At August 2018, the Authority had not considered whether the use of an interim target rate (goal) would help it focus its resources on those units with compliance rates that it views as unacceptable, and who have the highest risks of placing patients at risk.

Not actively holding patient-care units with unacceptable hand-hygiene compliance rates accountable increases the risk of not taking timely corrective actions, and places patients and staff at increased risk of hospital-acquired infections.

3. **We recommend that the Saskatchewan Health Authority actively monitor actions taken by Regina hospitals' patient-care units with lower than acceptable hand-hygiene compliance rates.**

4.8 Patient-care Units Informed of Risks of Infections Promptly

The Infection Prevention and Control Department immediately notifies relevant patient-care units in each Regina hospital of identified infections to reinforce infection control practices.

On a daily basis, the Department receives infection-related lab results from the Provincial Lab and the Regina General Hospital Lab.[26] The Department aggregates this data using an electronic spreadsheet, and then informs relevant patient-care units of the results promptly.

For one month of lab results of infections that we tested, the Department appropriately included all lab results received in its spreadsheet, and conducted timely infection transmission investigations. The Department investigates where the infection transmission occurred and promptly notifies units where the infection was acquired or transmitted.

[24] www.wrha.mb.ca/prog/ipc/files/HandHygieneComplianceQ1-2018-19.pdf (10 October 2018).
[25] www.albertahealthservices.ca/assets/about/publications/2017-18-annual-report-web-version.pdf (10 October 2018).
[26] Both the Regina General Hospital Lab and the Roy Romanow Provincial Laboratory, formerly the Saskatchewan Disease Control Laboratory, provide testing for communicable diseases.

4.9 Outbreaks of Infections Reported Promptly

The Authority has established, and used a clear protocol to report outbreaks of infections promptly.

Hospital-acquired infections may have serious consequences for high-risk patients with weak immune systems.

In Regina hospitals, the Authority may declare an outbreak if there are two or more transmissions in seven days. It consults medical microbiologists to assess the situation before confirming and declaring an outbreak.

Each hospital, through outbreak management procedures, requires staff to complete a checklist to make sure the hospital notifies all relevant parties (e.g., Ministry of Health, Public Health, management in the hospitals, physicians) of the outbreak. Staff must place notifications at the entrance to a unit to alert visitors and staff of a current outbreak, and procedures they must follow if they plan to enter the unit.

During the 12-months ending August 2018 (the audit period), the Regina hospitals reported two outbreaks of infections. For the one reported outbreak we tested, the Authority followed its established processes, and informed all relevant parties promptly. It also posted the outbreak information on its internal website for all staff. In addition, it gave relevant parties weekly updates until the outbreak was over.

As shown in **Figure 6**, the number of outbreaks of three common hospital-acquired organisms (Methicillin-resistant staphylococcus aureus, Vancomycin-resistant enterococcus, and Clostridium difficile) over the last three fiscal years in Regina General and Pasqua hospitals is low.

Figure 6—Number of Outbreaks by Organism Type for 2016-17, 2017-18, and 2018-19 in Regina Hospitals

Organism	2016-17	2017-18	2018-19[A]
Methicillin-resistant staphylococcus aureus (MRSA)	None	None	None
Vancomycin-resistant enterococcus (VRE)	5	1	None
Clostridium difficile	2	None	1

Source: The Infection Prevention and Control Department records.
[A] April-August 2018

4.10 Infection Rates Routinely Reported

Each quarter, the Infection Prevention and Control Department (Regina) makes data on infection rates readily accessible to hospital staff and management. It reports key rates to the Ministry and nationally, as expected.

The Department's clinical epidemiologist calculates monthly infection rates by facility, including hospitals, using aggregated lab information. We found the Department posts the results on its internal website quarterly and annually as expected.

The Authority actively monitors certain antibiotic-resistant organisms (e.g., Methicillin-resistant staphylococcus aureus [MRSA], Vancomycin-resistant enterococcus [VRE]) and Clostridium difficile (CDI) through surveillance programs. For example, under the Extended Stay for VRE and MRSA program, each hospital screens all admitted patients for these organisms every 30 days.

The Department calculates, using national standards, monthly infection rates for Antibiotic-Resistant Organisms, and Extended Stay for VRE and MRSA. We found that it reports the quarterly results for VRE and MRSA to the Canadian Nosocomial Infection Surveillance Program.[27] We also found it gave the Ministry of Health the number of CDIs each quarter as expected.

4.11 Better Analysis of Causes of Hospital-acquired Infections Needed

Active monitoring of infection rates was reduced during reorganization of the Authority's Infection Prevention and Control departments. Analysis of trends in the Regina hospitals and emerging risks and causes of hospital-acquired infections is limited.

Up to February 2018, the Executive Sponsorship Group of the former Regina Qu'Appelle Health Region received monthly reports on hospital-acquired infections, and written updates on infection prevention and control practices.[28] Management indicated that this Group is no longer active because of changes resulting from and pending due to the amalgamation of the Authority.

While the Infection Prevention and Control Department (Regina) continues to compare infection rates to its internal historical data to identify trends, since February 2018, neither it nor the Authority formally analyzed trends or determined root-causes for changes, and reported on them.

For instance, the Authority did not identify reasons for the decreased number of Vancomycin-resistant enterococcus infections for Regina General Hospital in the first two quarters of 2017-18 (see **Figure 7**), and the return in the last two quarters of 2017-18 to numbers similar to 2016-17.

In addition, reports on hospital-acquired infections did not identify the type of patients affected, potential causes of trends, or outline actions to reduce infection rates. Also, they did not link locations of incidents of hospital-acquired infections to the hand-hygiene compliance rates of those units.

[27] CNISP Network refers to the Public Health Agency of Canada's (PHAC's) Canadian Nosocomial Infection Surveillance Program (CNISP). The national program includes 10 provinces with 65 hospitals participating. Both Regina General Hospital and Pasqua Hospital submit data to PHAC.

[28] The Executive Sponsorship Group included the Medical Health Officer, the medical microbiologist, physician representatives, patient representatives, and several executive directors.

Figure 7—Number of Infections by Organism Type Acquired at Regina General and Pasqua Hospitals in 2016-17 and 2017-18[A]

Organism	2016-2017					2017-2018				
	Quarter One	Quarter Two	Quarter Three	Quarter Four	Total	Quarter One	Quarter Two	Quarter Three	Quarter Four	Total
Regina General Hospital										
Vancomycin-resistant enterococcus (VRE)	35	34	18	50	**137**	18	17	33	26	**94**
Methicillin-resistant staphylococcus aureus (MRSA)	30	30	23	22	**105**	16	14	13	9	**52**
Clostridium difficile	11	17	7	10	**45**	8	9	12	12	**41**
Pasqua Hospital										
Vancomycin-resistant enterococcus (VRE)	48	18	48	29	**143**	21	27	49	15	**112**
Methicillin-resistant staphylococcus aureus (MRSA)	7	13	13	8	**41**	5	6	7	8	**26**
Clostridium difficile	13	6	16	9	**44**	5	5	5	4	**19**

Source: The Infection Prevention and Control Department records.
[A]This table also includes cases when the organism causing infection was acquired but did not cause any signs or symptoms of infection.

Without routine analysis of infection trends and linkage to results of audits of infection prevention and control practices, the Authority may not sufficiently protect staff and patients from infections acquired in its facilities. The Authority also may miss identifying opportunities for improvement at the hospitals and units therein with higher than normal rates of hospital-acquired infection.

4. **We recommend that the Saskatchewan Health Authority regularly give senior management a written analysis of emerging risks and causes based on trends of hospital-acquired infections.**

At August 2018, management indicated that they were reorganizing responsibilities for infection prevention and control for the Authority as a whole. Management expects to have standardized province-wide reporting about infection prevention and control for senior management and the Board by the 2019-20 fiscal year.

4.12 Surgical-site Infections Monitored Monthly

The Authority monitors surgical site infections for a number of surgical procedures (e.g., caesarean sections, hysterectomies, colorectal, neurosurgery, total hip and knee replacements).

Surgical site infections may occur in the area of the skin where the incision was made, beneath the incision area in muscle and the tissues surrounding the muscles, or in any area of the body that was involved in surgery (e.g., a body organ). Surgical site infections may also include the common hospital-acquired infections (e.g., MRSA, VRE).

The Infection Prevention and Control Department (Regina) monitors patients post operation to determine if the patient contracted a surgical site infection. It uses a standardized formula to calculate infection rates for surgical site infections to help identify trends by surgical procedure, operating room, and surgeons.

On a monthly basis, the Department reports surgical site infection rates to the Surgical Executive Committee. This Committee is comprised of directors and executive directors of various surgical departments (e.g., obstetrics and gynecology, surgical care services, orthopedics). The Committee uses this data for research and corrective action if required (e.g., discussions with surgeons). We reviewed the minutes of this Committee and found that they regularly discuss surgical site infection rates and research activities.

5.0 Selected References

Accreditation Canada. (2017). *Infection Prevention and Control Standards*, Ver. 12. Ottawa: Author.

Infection Prevention and Control Canada (IPAC) Canada. (2016). *Infection Prevention and Control (IPAC) Program Standard*. Winnipeg: Author.

Office of the Auditor General of Alberta. (2013). *Report of the Auditor General of Alberta, October 2013, Infection Prevention and Control at Alberta Hospitals*. Edmonton: Author.

Office of the Auditor General of New Brunswick. (2015). *Report of the Audit General – 2015 Volume II, Horizon and Vitalité Health Networks and the Department of Health Infection Prevention and Control in Hospitals*. Fredericton: Author.

Office of the Auditor General of Nova Scotia. (2012). *Report of the Auditor General, May 2012, Health and Wellness: Infection Prevention and Control at Cape Breton District Health Authority and Capital Health*. Halifax: Author.

Provincial Auditor of Saskatchewan. (2014). *2014 Report – Volume 1, Chapter 13, Sunrise Regional Health Authority – Infection Prevention and Control in Long-Term Care Facilities*. Regina: Author.

Provincial Auditor of Saskatchewan. (2011). *2011 Report – Volume 2, Chapter 14F, Prairie North Regional Health Authority: Hospital-acquired Infections*. Regina: Author.