Prairie North Regional Health Authority: Hospital-acquired infections

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Main points

Infections acquired in hospitals cause complications and significantly increase the cost of care due to longer hospital stays, greater use of drugs, etc. Regional health authorities are responsible to keep patients safe.

We found Prairie North Regional Health Authority (Prairie North) had effective processes to protect patients from infections except in a few areas. Prairie North needs to improve its accountability process, training plan, monitoring practices, and reporting information about sufficient hospital-acquired infections to help analyze and report emerging risks. We made six recommendations to strengthen these processes.

Introduction

Some people get infections while in hospital. These hospital-acquired infections are a risk that hospitals must control to manage health care economically and safely for patients. This chapter sets out the findings of our audit about processes used by Prairie North Regional Health Authority (Prairie North) to protect patients from hospital-acquired infections.

Prairie North serves a population of nearly 100,000.[1] It has six hospitals: two regional hospitals (North Battleford, Lloydminster), one district hospital (Meadow Lake), two small community hospitals (Maidstone, Turtleford), and the provincial psychiatric rehabilitation hospital. During 2010-11, these hospitals admitted about 11,000 patients.[2] Prairie North employed over 3,100 staff and spent about $229.5 million in 2010-11 to provide health services across its wide geographic region.[3]

The Ministry of Health holds regional health authorities accountable to "continuously improve health care safety." This includes using an infection control plan and best practices recommended by Accreditation Canada. The Ministry of Health expects regional health authorities to "implement remediation strategies in areas deemed necessary … for ensuring … compliance with relevant … Accreditation Canada standards for infection prevention and control … including required organizational practices." [4]

Like other public service agencies, Prairie North must balance financial limitations and high public expectations. Its board is accountable for the quality of care and patient safety including infection control. [5]

Background—the risk of hospital-acquired infections

A hospital-acquired infection is one that is neither present nor incubating when a patient is admitted to hospital.[6] Infections acquired in a hospital

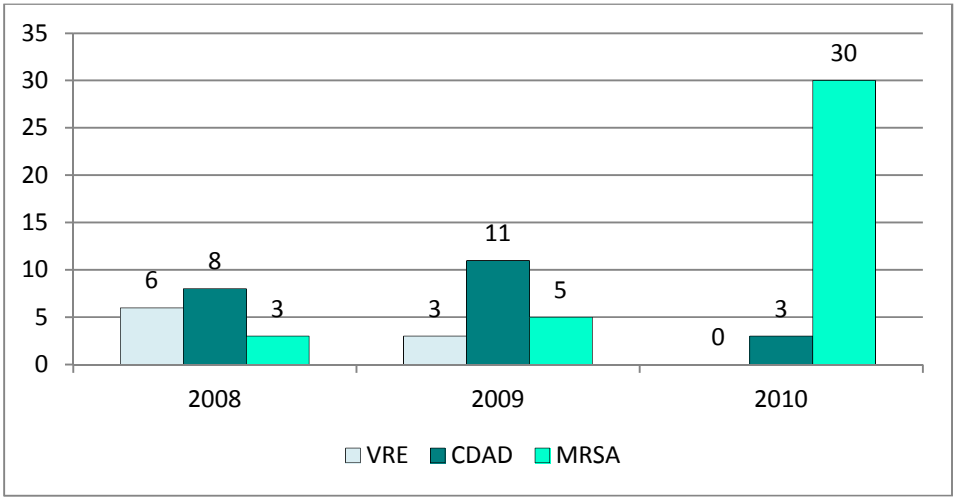
[1] Prairie North Health Region *2010-11 Annual Report*, p.5. This population includes nearly 20,000 people living in Alberta who use Saskatchewan health services.
[2] Prairie North Health Region *2010-11 Annual Report*, p. 7.
[3] Ibid., p. 48.
[4] 2011-12 Strategic and Operational Directions for the Health Sector in Saskatchewan, p. 8.
[5] *The Regional Health Services Act, 2002.*
[6] World Health Organization. Prevention of hospital-acquired infections: A practical guide. (2002), p. 1.

occur most commonly due to the growth of bacteria in the patient's skin, respiratory tract, urinary tract, or blood stream. For example, bacteria commonly found on the skin can cause infection after surgery.

Infections cause complications and significantly increase the cost of care due to longer hospital stays, greater use of drugs, more laboratory tests and other procedures, etc.[7,8] Some patients die as a result of infections they acquire while in hospital. For example, in 2004, Clostridium difficile infections in Montreal and Calgary hospitals resulted in over 80 deaths.[9]

Table 1 below shows Prairie North reported a fluctuating number of hospital-acquired infections in its three main hospitals (North Battleford, Lloydminster, and Meadow Lake) during 2008 to 2010.

Table 1—Hospital-acquired infections reported by Prairie North



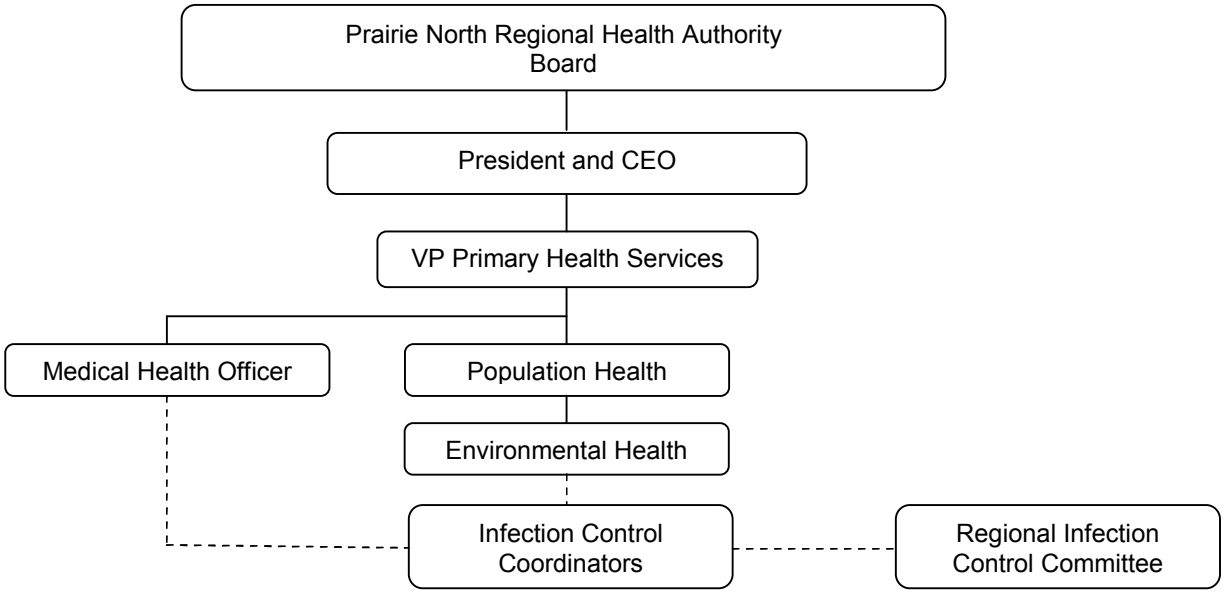
Source: *Prairie North Health Region 2010-11 Annual Report*, p. 21
Note 1: These are the number of cases reported in the three main hospitals. The 2008 cases do not include Meadow Lake; 2010 cases reflect changed definitions for hospital-acquired infections, accounting for some of the increase in MRSA.
Note 2: For explanations of VRE, CDAD, MRSA see footnote 15.

Good infection control practices prevent most hospital-acquired infections, thus avoiding patients' pain and extra health system costs.[10]

[7] United Kingdom National Audit Office. (2000). *The management and control of hospital acquired infection in acute NHS trusts in England*. London: Author. p.19.
[8] Montreal Jewish General Hospital 2004 study of ventilator-associated infections. Canadian Institute of Health Information. Also Canadian Institute for Health Information 2008 brief on Ontario patient safety.
[9] Eggertson, L. & Siddald, B. (2004). Need for national surveillance for hospital infections. *CMAJ* 171(1).
[10] Canadian Institute of Health Information. (2004). *Health Care in Canada*. Toronto: Author. p. 61.

Consistent hand washing and general cleaning practices can reduce the rate of hospital-acquired infections. Other infections can be prevented with the use of specific prevention protocols (e.g., limited use of urinary catheters, preparation of patients for surgery). Good governance and clear accountability are also important. Chart 1 sets out the governance and accountability arrangements used in Prairie North in 2011 (accountability is further explained later in this report).

Chart 1—Organizational lines of accountability for infection control



Audit objective, scope, criteria, and conclusion

The objective of this audit was to assess if Prairie North Regional Health Authority had effective processes from August 1, 2010 to July 31, 2011, to protect patients from hospital-acquired infections. We focused on processes in the three largest acute care hospitals (North Battleford, Lloydminster, and Meadow Lake). We did not audit Prairie North's processes in long-term care facilities or how they handled medical devices.

To conduct this audit, we followed the *Standards for Assurance Engagements* published in the *CICA Handbook - Assurance*. We examined policies, procedure manuals, minutes, infection control reports, and other relevant documents. We interviewed key managers and staff. We also observed practices in several work units (e.g., operating rooms, intensive care units, medical units, surgical units, sterilization areas).

To evaluate Prairie North's processes, we used criteria (see Exhibit 1) based on the selected references at the end of the chapter. The criteria are also consistent with Accreditation Canada standards. Prairie North's management agreed with the criteria.

Exhibit 1—Audit criteria for managing hospital-acquired infections

1. Plan to manage hospital-acquired infections
   - 1.1. Plan to meet national standards and official requirements
   - 1.2. Set out clear expectations
   - 1.3. Update the infection control plan regularly
   - 1.4. Plan a communication strategy
2. Use good practices to prevent, control, and monitor infections
   - 2.1. Adopt methods to prevent and control infections
   - 2.2. Train staff to maintain competence for safe practice
   - 2.3. Provide resources to prevent and control
   - 2.4. Monitor infection control practices regularly
3. Use information system effectively
   - 3.1. Use a central reporting system to monitor infections
   - 3.2. Control quality of data about infections
   - 3.3. Analyze data to identify emerging risks, trends, and areas for action
4. Report results for continuous improvement
   - 4.1. Report infections promptly to health care practitioners
   - 4.2. Report infection rates to management and infection control committee
   - 4.3. Review infection control reports regularly
   - 4.4. Inform relevant partners about infection risks and trends

Hospital-acquired infection rates vary widely by facility, type of patient, care procedures, and the standards used to guide data collection. Obtaining complete and comparable information about infections acquired in hospitals is difficult. Some infections are not reported and others are reported in a way that is not comparable. Prairie North primarily monitors and reports serious and/or antibiotic-resistant infections acquired in its hospitals. It does not report other hospital-acquired infections. Limited reports about hospital-acquired infections put some limitations on the scope of our audit.

We concluded that from August 1, 2010 to July 31, 2011, the Prairie North Regional Health Authority had effective processes to protect patients from hospital-acquired infections except for its

accountability process, training plan, monitoring practices, and reporting information about sufficient hospital-acquired infections to help analyze and report emerging risks.

Key findings and recommendations

In this section, we set out our criteria (in italics), related key findings, and recommendations.

Planning to manage hospital-acquired infections

We expected the regional health authority to plan to meet national standards and official requirements related to infection control. We expected it to set out clear expectations, regularly update its infection control plan, and have a related communications strategy.

Requirements and expectations

Prairie North had a Regional Infection Prevention and Control Committee (Regional Committee). Members of this important Regional Committee included nursing supervisors, the Medical Health Officer, and other senior managers from across the region. Terms of reference established that the Regional Committee was responsible to develop policies, oversee infection-related education, and ensure that an effective reporting system was in place, etc.

Prairie North also assigned its Regional Committee to ensure it met formal standards and requirements. These standards include Accreditation Canada's recommended practices for infection control[11] and the Ministry of Health's requirements as set out in the Introduction of this chapter. For example, these requirements included having an infection control plan, clear procedures, staff training, and regular reports.

Prairie North employed two part-time and one full-time Infection Control Coordinators (Coordinators) in its three largest acute care hospitals.[12] The Coordinators were responsible to maintain an infection prevention and

[11] For a description of the accreditation process and the current status of Prairie North, see Accreditation Canada status report.
[12] Together these three infection control coordinators represented 1.8 full-time equivalent positions.

control program, provide training, and prepare reports about hospital-acquired infections. The Coordinators provided reports to the Regional Committee and carried out the decisions of the Regional Committee. Two of the three Coordinators shared responsibility for chairing the Regional Committee. Because the Coordinators are responsible to carry out work on behalf of the Regional Committee, they should not also be responsible to chair it.

1. **We recommend that Prairie North Regional Health Authority assign an appropriate chairperson for its Regional Infection Prevention and Control Committee (other than its Infection Control Coordinators).**

As shown in Chart 1, the accountability of the Infection Control Coordinators was not clear or direct in Prairie North. The Coordinators' job description stated that they could receive administrative guidance from a manager and could seek clinical advice from the Medical Health Officer. The Coordinators were not directly responsible to any manager for their performance related to controlling hospital-acquired infections.

2. **We recommend that Prairie North Regional Health Authority clarify the accountability and responsibility of its Infection Control Coordinators.**

Infection control plan and communication

In 2010, Prairie North developed an Infection Prevention and Control Plan to ensure it met national standards and other requirements.[13] The Board approved this plan in March 2011. The plan aimed to improve patient outcomes by preventing and controlling the spread of infections acquired in Prairie North's hospitals and other facilities. The plan set out goals, progress measures, and the actions needed. The plan also identified the staff assigned to lead each infection control initiative.

Prairie North planned for communication about infections. Coordinators informed staff immediately of any confirmed infections. The Coordinators communicated with staff through timely emails and managers' meetings.

[13] Required Organizational Practices and Standards of Accreditation Canada and the Canadian Standards Association Standards for healthcare.

Prairie North's Regional Communication Plan guided how it reported infection risks to the Board and the public. Policies required that the Medical Health Officer would decide if an infectious outbreak existed. The Regional Communication Plan gave responsibility to the Vice-President of Primary Health Services for communicating to the Board and the public about infectious outbreaks. As no infectious outbreaks were declared in the region's hospitals during our audit period, we could not assess whether staff followed these policies.

Using good practices to prevent and control infections

We expected the regional health authority to adopt methods to prevent and control infections and train its staff to use them competently. We expected it to provide resources to make infection control practices feasible and to monitor regularly that staff used appropriate practices.

Adopting infection control practices and training staff

Prairie North's regional manual described the methods it had adopted to guide staff about infection prevention and control. The manual provided clear and detailed guidance for a wide range of situations. It was accessible to all staff on work units and on Prairie North's intranet. The Coordinators and the Regional Committee routinely updated the policies and procedures in the manual. In addition, during 2010-11, the Coordinators emphasized planning for renovations and new facilities to ensure the design helped to protect patients from hospital-acquired infections.

Coordinators learned about effective infection control practices in their professional training and in meetings with the coordinators of other regional health authorities. They also learned best practices to investigate and analyze hospital-acquired infections through ongoing education.

Prairie North provided formal orientation on infection control to all new staff as soon as possible after they started work. The orientation included an overview of infection prevention and control, and reviewed practices set out in the manual (e.g., hand hygiene, single use of gloves).

In addition, Coordinators provided ad hoc training to staff. Prairie North had not identified what education its staff should receive routinely about

preventing and controlling infections. It did schedule routine updates for key infection control practices. Prairie North's Infection Prevention and Control Plan expected that by December 2011, Coordinators would assess what education staff needed. In the future, it hoped to prepare a training plan about hospital-acquired infections. Such a training plan would set out mandatory education and routine updates about infection control for specific groups of staff including cleaning staff, nursing staff, and physicians. Such a training plan would help Prairie North ensure all of its staff know best practices for preventing hospital-acquired infections.

3. We recommend that Prairie North Regional Health Authority complete the development of a formal training plan for infection prevention and control that is suitable for its organization, services, and client population.

Providing resources to prevent and control infections

Prairie North allocated resources to prevent and control infections. It provided gloves, masks, and gowns in good supply where needed. The Regional Committee routinely evaluated products to ensure that each product achieved its intended purpose and was safe for patients and staff. For example, Prairie North tested cleaning products to determine whether the chemicals in new products were effective and suitable for use in its facilities. In addition, we observed that Prairie North hospitals had special rooms where it could take precautions to prevent the spread of airborne infections.

Because of its wide geographic area, Prairie North allocated resources for Coordinators in three locations to improve the effectiveness of its infection prevention and control. These coordinators promoted practices preventing infections and handled issues related to hospital-acquired infections.

Monitoring practices that prevent or control infections

We observed that Prairie North's three major hospitals used good practices and monitored how staff used some good practices for infection control. For example, Prairie North ensured its sterilization process worked by checking its effectiveness routinely.

Hand washing is an essential best practice. Prairie North made hand-sanitizer available at hospital doors, nurses' desks, meeting rooms, offices, and outside all patient rooms. The hospitals also displayed posters reminding staff, patients, and visitors about good hand washing methods. In late 2010 and early 2011, Prairie North monitored whether its staff used correct hand washing methods (i.e., hand-hygiene observation audits). These hand-hygiene audits provided a baseline for future monitoring and showed that by April 2011, Prairie North's staff had significantly improved the effectiveness of their hand hygiene practices. It planned to continue these hand-hygiene audits in all its hospitals.

Prairie North monitored some infection control practices routinely. Supervisors' job descriptions (e.g., for housekeeping, laundry, cleaning) required them to be aware of patient safety and/or specifically mentioned infection control. Prairie North expected that during their daily work, supervisors and the Coordinators would observe infection control practices and discuss any issues with staff. In addition, Prairie North conducted audits of some practices (e.g., sterilization, handling of linens and other supplies to prevent contamination) and planned to audit other practices in future. Prairie North did not maintain an ongoing system to track the results of its monitoring or to report these results to senior management.

4. We recommend that Prairie North Regional Health Authority formalize its processes to monitor and report consistently its key practices to control hospital-acquired infections.

Using information systems to monitor infections

We expected the regional health authority to use a central reporting system to monitor infections, and to have processes to control the quality of its data about infections. We expected it to analyze data to identify emerging risks, trends, and areas for action.

Using information systems to collect information contributes to patient safety. Hospitals collect information through routine surveillance, periodic studies, and reporting adverse events. Routine surveillance often focuses on specific work units, certain bacteria, and vulnerable patient groups

(e.g., cancer patients or others with less ability to fight infections including the very young and the very old).[14]

Using a central reporting system

In 2010-11, Prairie North had centralized information about three specific hospital-acquired bacterial infections. Prairie North's policies required laboratories to report promptly any positive results for clostridium difficile, and two antibiotic-resistant bacteria (i.e., methicillin resistant staphylococcus aureus (MRSA), and vancomycin resistant enterococcus (VRE)).[15]

The Coordinators monitored laboratory results about these three infections in Prairie North's three main hospitals on a daily and weekly basis. The Coordinators used an electronic spreadsheet to aggregate this data and calculate monthly infection rates.

In addition, Prairie North studied one additional hospital-acquired infection each year. The infections selected for study focused on a specific care unit (e.g., intensive care), patient population (e.g., surgical patients), and/or infection type. Most often the infections chosen for study were related to infections following surgery (e.g., after caesarean sections or hysterectomies). Post-surgical infections may not become evident during hospitalization so special studies are useful. Periodic studies also provide an opportunity to raise awareness about preventing hospital-acquired infections.

Prairie North did not report information about other hospital-acquired infections such as those associated with tubing inserted into the body (e.g., urinary catheters, intravenous, ventilator-associated pneumonia). Without this information, Prairie North might underestimate the risks faced by patients in the region's hospitals and might miss opportunities to provide safer, better quality care.

[14] Canadian Institute for Health Information, 2008 (see selected references).
[15] CD (Clostridium difficile) is a bacterial spore that causes irritation in the bowel leading to severe cramps and diarrhea; MRSA (methicillin resistant staphylococcus aureus) is a bacteria resistant to common antibiotics and that affects heart, lungs, bones, joints, and/or bloodstream; VRE (vancomycin resistant enterococcus) is a bacteria resistant to common antibiotics and causing severe urinary tract infections. Prairie North was exploring the collection of information on a fourth type of infection.

Collecting data and reporting routinely about selected other infections would improve Prairie North's ability to identify emerging risks and protect patients from hospital-acquired infections. Selecting which infections to monitor can be complex. It requires analysis of the risk of harm to patients and the cost of longer hospital stays compared to the cost of monitoring infections that patients acquire in the hospital.

5. We recommend that Prairie North Regional Health Authority monitor and report additional hospital-acquired infections after analyzing risks to patients and costs to the healthcare system.

Data quality and analyzing infection risks and trends

Prairie North had processes to control the quality of its data about infections. It had procedures to guide how it collected information about hospital-acquired infections (e.g., defined infections to be monitored, documented calculation methods). On a quarterly and annual basis, the Coordinators aggregated the collected data to report the rate of new cases of hospital-acquired infections. The Medical Health Officer reviewed these reports to verify accuracy prior to their distribution.

The quarterly and annual reports listed the rate of infection for each of the three bacteria that Prairie North monitored. These reports went to the Regional Committee and senior managers who used the information to decide if Prairie North needed to take further action to prevent infections. The Coordinators also informed staff and visitors about infections (e.g., posters, reports on hospital walls) to encourage preventive measures such as careful hand washing.

The quarterly and annual reports contained three-year trends but did not analyze the results. The reports did not describe common causes of the infections, risks, areas for action, or any explanation for the results. For example, the 2010 annual report to staff noted a continuing rise in the rate of MRSA infections in all facilities, with the largest increase in one hospital. The report did not identify the type of patients affected or potential causes of the trend. The report did not explain how Prairie North planned to address the issue or what actions staff could take to reduce the infection rate. Investigation and analysis of the causes of infections

would make the reports more useful and would help to identify emerging risks and required actions to reduce hospital-acquired infections.

6. We recommend that Prairie North Regional Health Authority regularly provide to senior management a written analysis of emerging risks based on trends and causes of hospital-acquired infections.

Prairie North's infection control plan set two measures related to hospital-acquired infections. Prairie North expected its staff to achieve a 95% target rate for use of good hand hygiene (66% in April 2011). It also expected increasing compliance with staff immunization against influenza (51% of staff complied as of March 2011). Both these measures have potential to reduce hospital-acquired infections significantly.

Reporting results for continuous improvement

We expected the regional health authority to report infections promptly to health care practitioners to avoid further spread. We expected its management and infection control committees to review infection control reports regularly. We also expected the regional health authority to inform relevant partners (such as other hospitals or long-term care referral agencies) about infection risks and trends.

Reporting infections and reviewing trends

Prairie North reported infections promptly to health care practitioners. The coordinators received laboratory results daily and weekly about infections and reviewed the reports promptly. The coordinators verified that nursing staff had marked patients' charts to communicate these results to other care providers. In addition, Prairie North labelled patients' rooms with the required precautions, if necessary (e.g., use gloves, keep door closed). Prairie North also made quarterly reports (for the hospital) available to all staff on its intranet and bulletin boards in the hospitals. Keeping staff informed contributes to effective use of infection control practices.

Coordinators made regular reports to the Regional Committee and management. The Regional Committee received quarterly and annual reports on hospital-acquired infections in the three main hospitals. However, as previously noted, the reports did not describe the causes of

hospital-acquired infections or recommend action to protect patients and staff. Written analysis would help the Regional Committee to follow up on trends and recommend actions to reduce the number of infections acquired in its hospitals.

Informing relevant partners about infection risks

Prairie North made timely reports of infection risks to other health care agencies. When Prairie North transferred patients to other hospitals or long-term care facilities, staff completed a standard inter-agency referral form. This form accompanied the patient and identified the precautions required for infection control. Consistently using such a form ensures that ambulance drivers and staff receiving the patient into another facility know what care and precautions are required.

Prairie North also reported to health care providers the results of special surveys about hospital-acquired infections. For example, in 2010, Prairie North surveyed patients who had babies delivered by caesarean section. The coordinators presented the results to obstetricians practicing in the region as well as to its surgical staff.

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Accreditation Canada status report

Excerpt from Prairie North Regional Health Authority 2010-11 Annual Report, pp. 18-19

Strategy – Continuously improve health care safety in partnership with patients and families.
Results – Accreditation

Prairie North Health Region achieved Accreditation with Condition, following its third Regional Accreditation Survey May 31 - June 4, 2010 (PNHR Strategic Plan and SOD Document). A team of peer reviewers with Accreditation Canada visited the Region reviewing documentation and speaking with patients, residents and clients, staff and physicians, community partners and affiliate organizations of PNHR. The reviewers, who are health care professionals, assessed PNHR's compliance with Accreditation Standards and Required Organizational Practices (ROPs) for health care organizations. The process helps the Region better understand its status in terms of continuous safety and quality improvement (CSQI) in the provision of quality health care. The review assesses the Region in terms of its understanding of the requirements, what is being done well, what needs to be improved, and what next steps are required to make the necessary improvements. The Accreditation Conditions required that PNHR submit evidence by November 3, 2010 and May 3, 2011 of additional work necessary to meet some of the unmet Accreditation standards/ROPs. PNHR submitted its first report for the November 3rd deadline and was given an extension to complete work relating to infection prevention and control – specifically hand hygiene practices, monitoring, and reporting - as well as falls prevention in Long- Term Care and Mental Health Services. Work was underway to complete requirements for the May 3, 2011 report.

Note: Accreditation Canada notified Prairie North June 6, 2011 that it had complied with accreditation requirements related to infection control.

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