COMMUNICABLE DISEASE REPORT

Quarterly Report

Volume 29, Number 2 June 2012

Healthcare-Associated Infections

Overview

Healthcare-associated infections (HAIs) are infections caused by a wide variety of common and unusual bacteria, fungi, and viruses during the course of receiving medical treatment or surgical procedures.[1] HAIs are a common complication of hospital care with one in nine hospital patients in Canada acquiring these infections, which may force a longer stay, cause greater pain or even death.[2] Each year in Canada, more than 220,000 HAIs result in 8,500-12,000 deaths[2], and the rates are on the rise.[8] According to the Canadian Patient Safety Institute the price of treatment of HAIs is more costly than prevention; estimated cost for 2010 was $129 million.[3] These costs are associated with prolonged hospitalization, special control measures, expensive treatments and extensive surveillance.

Many HAIs can be prevented thorough implementation of evidence-based "best practices". Community and Hospital Infection Control Association (CHICA) - Canada has provided access to a number of best practice guidelines for the prevention of HAIs.[4] These include general guidelines for Hand Hygiene, Routine Practices and Additional Precautions as well as guidelines for the prevention of specific HAIs, such as, surgical site and urinary tract infections. As the ability to prevent HAIs grows, these infections are becoming increasingly unacceptable and the prevention and reduction of HAIs in Canadian healthcare must be a priority for action. Wherever patient care is provided, adherence to infection prevention and control guidelines is needed to ensure that all care is safe care.[1] This includes not only in traditional hospital settings but also in outpatient clinics, long-term care facilities, rehabilitation centres, personal care homes and community clinics.

HAIs "Agents"

Healthcare-associated infections are caused by viruses and bacteria, such as *Clostridium difficile* (*C. difficile*), methicillin-resistant *Staphylococcus aureus* (MRSA) and vancomycin-resistant *Enterococcus* (VRE), commonly encountered in healthcare facilities.

Reporting

In Newfoundland and Labrador (NL), infections with the following organisms are notifiable:

- *Clostridium difficile*
- Methicillin-resistant *Staphylococcus aureus* (MRSA)
- Vancomycin-resistant *Enterococcus (*VRE)

All laboratory-confirmed infections with these organisms are to be reported to the Regional Medical Officer of Health (RMOH) or designate responsible for appropriate investigation, treatment, case follow up and provincial reporting.

For a complete list of Reportable Diseases in Newfoundland and Labrador, please visit http://www.health.gov.nl.ca/health/publichealth/cdc/listabc20.pdf

Clostridium difficile

Clostridium difficile (C. difficile) is a bacterium that causes mild to severe diarrhea and intestinal conditions such as colitis, which is an inflammation of the colon. *C. difficile* bacteria and their spores are found in feces. *C. difficile* is highly infectious and can be spread from person-to-person or via the healthcare environment. *C. difficile* spores can remain on environment surfaces for many months requiring meticulous cleaning of the environment.

Overuse of antibiotics is the most important risk factor for getting *C. difficile* infection (CDI) as heavy antibiotic use may eradicate a patient's usual population of bacteria found in the intestines and colon. This allows *C. difficile* bacteria to grow and produce toxins, damaging the bowel and causing diarrhea. The presence of *C. difficile* bacteria, together with a large number of patients receiving antibiotics in healthcare settings, can lead to frequent *C. difficile* outbreaks.[5]

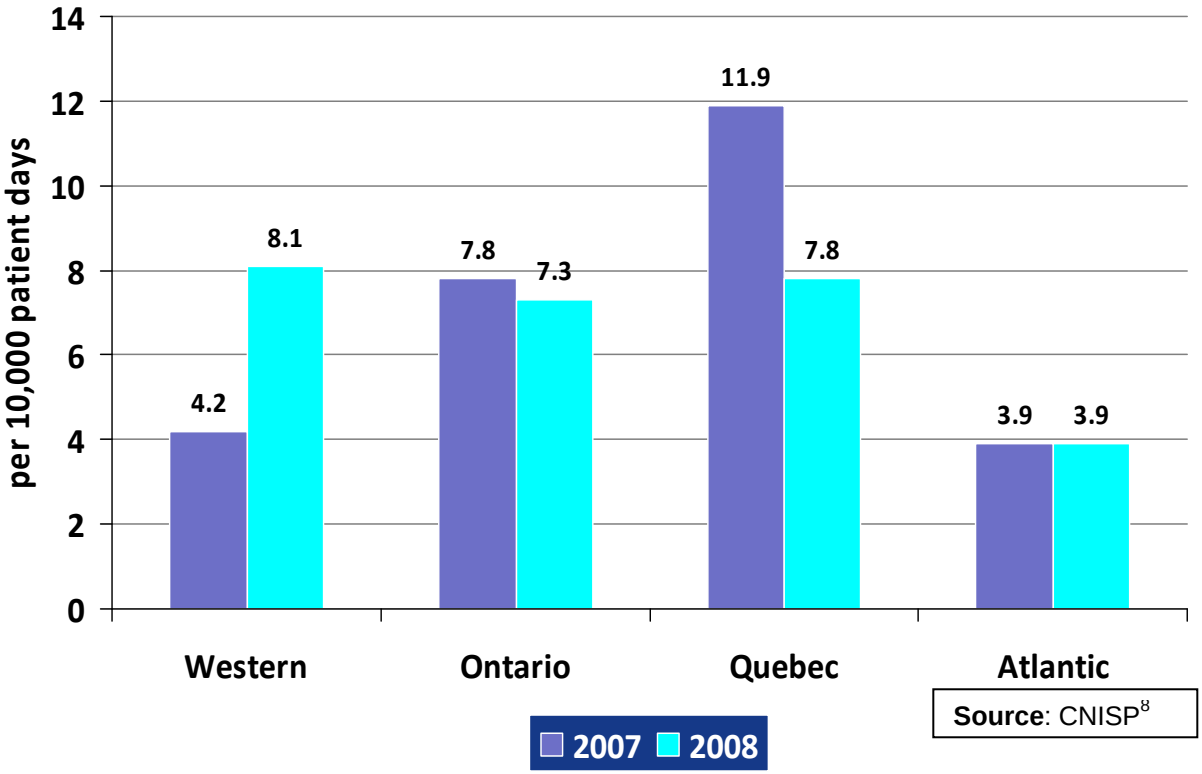
C. difficile is the most frequent cause of outbreaks of infectious diarrhea in Canadian hospitals and long-term care facilities.[5] In May 2011, an outbreak of *C. difficile* began in an Ontario hospital, and within a few months had spread through six hospitals across that province.[6] As of July 2011, 26 fatalities associated with the outbreaks had been reported in Ontario, with most deaths concentrated in the Niagara Region.[6]

Prevention of the transmission of *C. difficile* requires focus on the following activities:

- Hand hygiene - this is the single most important way to prevent the transmission of infection
- Surveillance - early recognition of a case of diarrhea is key to control
- Contact precautions - don't wait for lab results, isolate patients with diarrhea
- Microbiologic identification of cases - work with labs to ensure rapid reporting of tests for CDI
- Environmental controls - recognize the environment as a critical source of contamination and make certain that staff are properly trained in cleaning and disinfection methods
- Antimicrobial stewardship - ensure appropriate use of antibiotics
- Healthcare worker education - provide updates on rates of CDIs and prevention strategies
- Patient Education - share information on CDIs and provide instructions on hand hygiene

The Canadian Nosocomial Infection Surveillance Program (CNISP) has been collecting data and reporting on the rates and trends of specific HAIs since 1994.[7] Figure 1 gives an overview of the number of patients with CDI reported by the CNISP hospitals for the years 2007 and 2008. The Atlantic region includes reports from acute care hospitals in New Brunswick, Nova Scotia and Newfoundland Labrador. In Newfoundland Labrador, the data are reported from two hospitals, St. Clare's and the General Hospital of the Health Sciences Complex.

Figure 1: Incidence of CDI per 10,000 Patient Care Days by Province or Region, 2007-2008



In NL, the rates of CDI have been reportable to the province since 2009. Each Regional Health Authority (RHA) has statistics on these infections maintained by the regional Infection Prevention and Control Program. The CNISP rates are reflective of the trend of CDI reported by hospitals in NL.

Methicillin-resistant *Staphylococcus aureus*

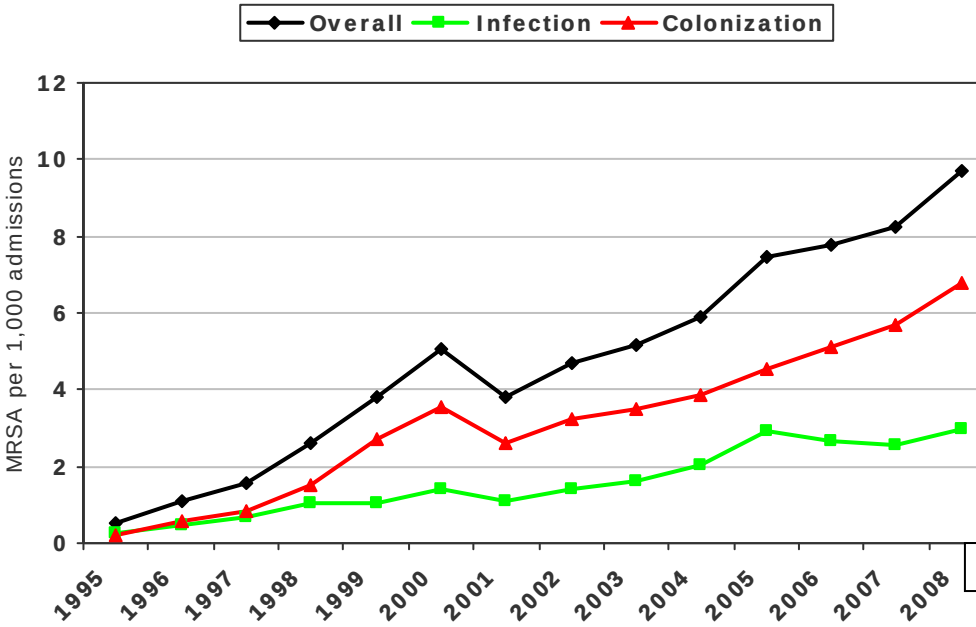
Staphylococcus aureus is a bacterium that periodically lives on the skin and mucous membranes of healthy people. When *Staphylococcus aureus* develops resistance to certain antibiotics called beta-lactams, it is known as methicillin-resistant *Staphylococcus aureus (*MRSA).[9] These antibiotics include methicillin and other more common antibiotics such as oxacillin, penicillin, and amoxicillin. In the community, most MRSA infections are skin infections. More severe or potentially life-threatening MRSA infections occur most frequently in healthcare settings, including lung, surgical site, and bloodstream infections.[9]

MRSA is commonly spread from one person to another *via* the hands of healthcare workers. Infection occurs when bacteria enters a body site and multiplies in tissue causing clinical

manifestation of disease. This is usually evident by fever, a rise in white blood cell count, or purulent drainage from a wound or body cavity.[9] A person can also be colonized with MRSA. Colonization is the presence of microorganisms in or on a host with growth and multiplication but without tissue invasion or cellular injury.

In 2011, CNISP reported a gradual but continued increase in overall MRSA rates in Canada with nosocomial (i.e., originating from reporting acute care facilities) infection rates remaining significantly high accounting for nearly two-thirds of all cases.[10] CNISP also reported a dramatic increase in community-associated MRSA cases. These cases did not have the traditional risk factors associated with healthcare exposure. The overall rate of MRSA infections in Canadian hospitals reported by CNISP is provided in Table 2.

Table 2: Incidence of MRSA per 1,000 patient admissions, 1995-2008



Source: CNISP[8]

In NL, the rates of MRSA infections and colonizations have been reportable to the province since 2009. Each RHA has statistics on these infections maintained by the Infection Prevention and Control Programs. The provincial pattern is similar to that reported nationally by CNISP.

Vancomycin-Resistant Enterococci (VRE)

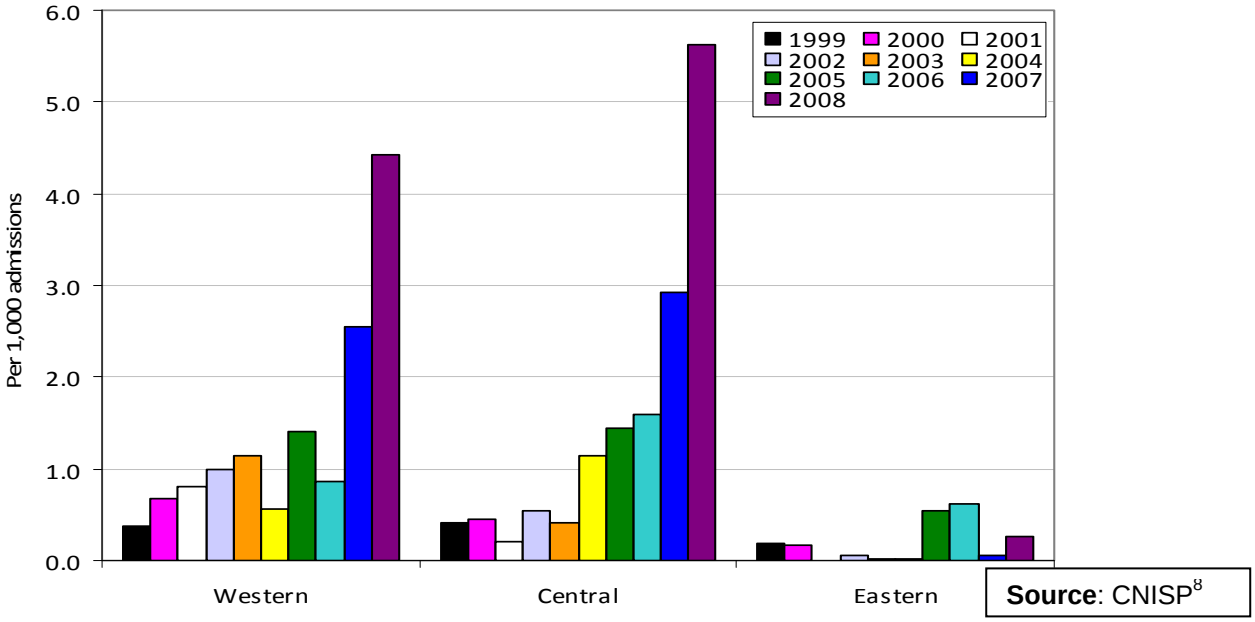
Vancomycin-resistant *Enterococci* (VRE) are specific types of bacteria that are resistant to vancomycin, the antibiotic often used to treat infections caused by *enterococci*. *Enterococci* are bacteria that live in the environment and in the gastrointestinal tract of most individuals and generally do not cause harm.[11] Sometimes these bacteria can cause infections, such as, a urinary tract or blood stream infection. Most VRE infections occur in hospitals.

VRE is spread from one person to another by contact, usually on the hands of healthcare workers. VRE can be present on the caregiver's hands either from touching contaminated material excreted by the infected person or by touching contaminated environmental surfaces.

VRE can survive for weeks on inanimate objects such as toilet seats, door handles, bedrails, furniture, stethoscopes, rectal thermometers and bedpans.[11]

Another core surveillance activity for CNISP is for VRE. Figure 3 shows the incidence rates for VRE reported by participating hospitals in Canada. The Eastern Region refers to data from New Brunswick, Nova Scotia and Newfoundland Labrador.

Figure 3: Overall VRE incidence rates per 1,000 patient admissions by region, 1999-2008



In NL, the rates of VRE infections have been reportable to the province since 2009. Each RHA conducts surveillance for VRE infections. There have been no reports of VRE infection to the province since VRE became notifiable in 2009.

Infection Prevention and Control: Hand Hygiene

Healthcare-associated infections can be limited by strict adherence to infection prevention and control measures. Optimal hand hygiene is one of the most effective measures to reduce healthcare associated infections and to avoid preventable deaths. Hands of healthcare workers are the most common vehicle for the transmission of microorganisms from: one patient to another, one body site to another within the same patient, and/or a contaminated environment to patients. Studies show that performing proper hand hygiene could reduce the incidence of these infections significantly.[12-13]

Hand hygiene is a general term referring to any action of hand cleansing that removes or kills microorganisms on the hands. Hand hygiene may be performed with an alcohol-based hand rub (ABHR) or by using soap and running water. ABHR is the preferred method because it is faster and it is better tolerated by hands than washing with soap and water. However, soap and water should be used when hands are visibly soiled and whenever ABHR is not available, or when isolation precautions require it. Since *C. difficile* spores may be relatively resistant to

alcohol-based hand rubs, it has been recommended that hands be washed with soap and water after glove removal during outbreaks of *C. difficile*.

In May 2012, the Department of Health and Community Services developed a provincial *Hand Hygiene Campaign* as an extension of the 2006 *Clean, Cover and Contain Program*. The purpose of this initiative is to increase awareness of the importance of hand hygiene in the prevention of infections.

This fall, the Department of Health and Community Services, in collaboration with the Department of Education, will be promoting hand hygiene. In keeping with the theme *Clean Hands Across the Land*, the Provincial Government has developed a poster to highlight the importance of "cleaning your hands and cleaning them often".

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Newfoundland and Labrador Communicable Disease Surveillance
Monthly Disease Report: June 2012

DISEASE CLASS	DISEASE NAME	TOTAL			EASTERN			CENTRAL			WESTERN			LABRADOR GRENFELL		
		June	YTD 12	YTD 11	June	YTD 12	YTD 11	June	YTD 12	YTD 11	June	YTD 12	YTD 11	June	YTD 12	YTD 11
Enteric, Food and Waterborne	Amoebiasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Botulism	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Campylobacteriosis	**7**	**16**	**20**	**6**	**12**	**15**	0	**3**	**2**	**1**	**1**	**3**	0	0	0
	Cryptosporidiosis	0	**3**	0	0	0	0	0	0	0	0	**3**	0	0	0	0
	Cyclosporiasis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Cytomegalovirus	**1**	**3**	**4**	0	**1**	0	**1**	**1**	**1**	0	**1**	**2**	0	0	**1**
	Giardiasis	**3**	**16**	**21**	0	**1**	**4**	0	**2**	**3**	**3**	**13**	**13**	0	0	**1**
	Hepatitis A	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Listeriosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Norovirus Infection	**2**	**92**	**45**	**1**	**17**	**13**	**1**	**8**	**30**	0	**50**	**2**	0	**17**	0
	Salmonellosis	**8**	**43**	**29**	**6**	**17**	**14**	**1**	**9**	**8**	0	**6**	**4**	**1**	**11**	**3**
	Shigellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Typhoid/Paratyphoid Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Verotoxigenic Escherichia coli	0	0	**2**	0	0	**2**	0	0	0	0	0	0	0	0	0
	Yersiniosis	0	**1**	0	0	0	0	0	0	0	0	**1**	0	0	0	0
Diseases Transmitted by Direct Contact and Respiratory Route	Creutzfeldt-Jakob Disease (CJD)	0	0	**1**	0	0	0	0	0	0	0	0	**1**	0	0	0
	Group B Streptococcal Disease of Newborn	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Influenza Virus of a Novel Strain	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Influenza A, Laboratory Confirmed	0	**115**	**206**	0	**24**	**110**	0	**37**	**25**	0	**9**	**42**	0	**45**	**29**
	Influenza B, Laboratory Confirmed	0	**208**	**43**	0	**81**	**25**	0	**34**	**16**	0	**51**	0	0	**42**	**2**
	Invasive Group A Streptococcal Disease	0	**2**	**1**	0	**1**	0	0	**1**	0	0	0	1	0	0	0
	Invasive Haemophilus Influenza non-type B	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Invasive Meningococcal Disease (IMD), Conf	0	0	**1**	0	0	0	0	0	1	0	0	0	0	0	0
	Invasive Meningococcal Disease (IMD), Prob	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Invasive Pneumococcal Disease (IPD)	**2**	**12**	**9**	0	**6**	**7**	**1**	**2**	0	**1**	**3**	**2**	0	**1**	0
	Legionellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Meningitis, Bacterial (other than Hib, IMD or IPD)	0	**2**	**1**	0	0	**1**	0	0	0	0	**1**	0	0	**1**	0
	Meningitis, Viral	0	0	**3**	0	0	**3**	0	0	0	0	0	0	0	0	0
	Nontuberculosis Mycobacterial Disease	**1**	**6**	**4**	**1**	**6**	**3**	0	0	0	0	0	0	0	0	**1**
	Severe Respiratory Illness, unknown origin	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Newfoundland and Labrador Communicable Disease Surveillance
Monthly Disease Report: June 2012

DISEASE CLASS	DISEASE NAME	TOTAL			EASTERN			CENTRAL			WESTERN			LABRADOR GRENFELL		
		June	YTD 12	YTD 11	June	YTD 12	YTD 11	June	YTD 12	YTD 11	June	YTD 12	YTD 11	June	YTD 12	YTD 11
	Tuberculosis, non-respiratory	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1
	Tuberculosis, respiratory	0	2	3	0	0	2	0	0	0	0	1	0	0	1	1
Sexually Transmitted and Bloodborne Pathogens	Chlamydia	86	437	293	40	238	163	11	34	29	12	53	23	23	112	78
	Gonorrhoea	1	7	10	0	2	1	0	0	0	0	0	0	1	5	9
	Hepatitis C	3	37	33	2	29	24	1	2	2	0	6	7	0	0	0
	HIV Infection	0	2	2	0	2	1	0	0	0	0	0	1	0	0	0
	Syphilis, infectious	3	4	3	3	4	3	0	0	0	0	0	0	0	0	0
	Syphilis, non-infectious	0	1	3	0	1	3	0	0	0	0	0	0	0	0	0
Vectorborne & Other Zoonotic Diseases	Lyme disease	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Malaria	1	1	2	1	1	2	0	0	0	0	0	0	0	0	0
	Q Fever	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rabies	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Toxoplasmosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Trichinellosis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	West Nile Virus Infection	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Vaccine Preventable	Chickenpox	37	329	175	35	73	71	2	162	14	0	91	89	0	3	1
	Congenital Rubella Syndrome	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Hepatitis B	1	8	13	1	8	10	0	0	3	0	0	0	0	0	0
	Invasive Haemophilus Influenza type B (Hib)	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Measles	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Mumps	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Pertussis	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Rubella	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Tetanus	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0

Source: Communicalble Disease Control System, Department of Health and Community Services, Government of Newfoundland and Labrador

Date verified: 17-Oct-2012

Disclaimer: Data are subject to continuous updates; small variations in numbers may occur.

Note: Prior to January 2011, "Invasive Meningococcal Disease, Probable" was included under the heading "Invasive Meningococcal Disease"