



March 2009

Dr. Lynn Stevenson
Dr. Owen Heisler
Executive Sponsors

I am pleased to provide you with my report entitled "Report on Infection Control in the Vancouver Island Health Authority: A Focus on Action".

Respectfully Submitted

A handwritten signature in black ink, appearing to read "Richard S. Stanwick", with a long, sweeping horizontal stroke extending to the right.

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Chief Medical Health Officer



Report on Infection Control in the Vancouver Island Health Authority:

A Focus on Action

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Chief Medical Health Officer
Vancouver Island Health Authority

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EXECUTIVE SUMMARY

The topic of hospital patients acquiring infections while in hospital (nosocomial infections) is one of ongoing concern to medical personnel, health authorities, patients and family, not just on Vancouver Island or in British Columbia, but throughout Canada, North America and in fact the developed world. In 2006, it was estimated that about 220,000 nosocomial infections occurred throughout Canada. Patients in hospital – who generally have underlying health conditions and may be immuno-compromised – are particularly vulnerable. Of the 220,000 infections, about 8,000 patients annually have died as a direct or indirect result of these nosocomial illnesses.

Among the most troublesome hospital-acquired infections are MRSA (methicillin-resistant staphylococcus aureus), VRE (vancomycin-resistant enterococcus), and, in recent years, *Clostridium difficile*. *C. difficile* is not an uncommon organism, and can be found in the bowel of 4-6% of the adult population with the individuals having little to no symptoms. When introduced to the health care setting, *C. difficile* has been found to be a particularly troublesome organism once it gains a foothold. Major outbreaks of a particularly virulent strain of *C. difficile* (known as the NAP 1 strain) have resulted in significant challenges for health authorities in England and the province of Quebec and have been associated with many deaths.

C. difficile continues to mutate, and an even more virulent strain, Nap 27, has been identified in Eastern Canada. *C. difficile* spores can persist in the environment outside the human body for long periods of time, and have proven to be difficult to eradicate. A concentrated solution of bleach has been found the best way of destroying the spores. However, the rapidly changing nature of nosocomial infections and their management has resulted in an uneven mix of “best practices” that health authorities can implement to respond to outbreaks. For example, standards have been established for surveillance of hospital-acquired infections, but not for cleaning solutions and the most effective use of microfibre products in cloth wipes and mops.

It is critically important that responses to outbreaks are effective and coordinated, as not only do outbreaks have significant personal negative impact on patients and family, but they also have financial implications for the facility affected by the outbreak. Not only do affected facilities incur higher infection control costs, but the cost of treating a patient with a hospital-acquired infection is up to 50% higher than treating a non-infected patient.

On Vancouver Island, the challenges with hospital-acquired *C. difficile* infections are exemplified by what has occurred at Nanaimo Regional General Hospital (NRGH). An increase in cases of *C. difficile* was first noted at NRGH in 2003-04 and was reviewed in a report by the BC Auditor General in 2006-07. An assessment of the situation at that time determined eight specific actions to be taken, and as these steps were implemented, the rate of infection was successfully reduced at NRGH.

However, in June 2008 the number of patients infected with *C. difficile* at NRGH was found to be increasing again. This trend continued through to September 2008, despite application of enhanced infection control measures. As a result, Dr. BH and her team from the BC Centre for Disease Control (BCCDC) were asked by the Vancouver Island Health Authority (VIHA) to undertake an independent review of the situation and to identify preventive measures to not only address the situation at NRGH, but to also reduce the likelihood of a similar event occurring at other VIHA facilities.

In addition to the BCCDC review, the VIHA Board and Executive tasked me in my capacity as Chief Medical Health Officer of the Vancouver Island Health Authority to identify actions that could mitigate not only the hospital-acquired infection *C. difficile*, but also nosocomial infections generally in the health authority. The recommendations in the following report were formulated using existing resources such as previous reports, including those generated by accreditation reviews, coupled with interviews of VIHA staff involved with the Infection Prevention and Control Program, and other experts within British Columbia.

The key recommendations in my report focus on the need for the health authority to put an even greater emphasis on infection control in the hospitals and long term care facility settings. This new importance must be subscribed to at all levels of the organization, from housekeeping to the Executive. I believe substantial benefit will be gained from reaffirming that the Infection Prevention and Control Program's role in an outbreak is advisory and not operational, and that managing and controlling nosocomial infection is the responsibility of all of Integrated Health Services in VIHA.

Organizationally, infection control must be valued, both in practice and perception, as much as quantifiable services, such as those delivered by medicine and surgery.

I also further recommend that VIHA should appoint a clinical lead for the Infection Prevention and Control team, someone whose sole job would be to work with all VIHA facilities on the prevention of outbreaks as well as implementing measures to prevent their occurrence. The VIHA leadership, including the infection control team, should be involved in developing a protocol that would be used to manage any future outbreaks in any VIHA facilities. An appropriate Hospital Incident Command System should also be established to aid in the management of outbreaks and clarify the individual roles for VIHA staff and contractors.

My report notes that cleaning, housekeeping and environmental controls are all key parts of preventing and controlling outbreaks of *C. difficile* and other nosocomial infections. In addition to ensuring contract service levels are realized, I recommend that standardized metrics be established for regular housekeeping as well as for cleaning during outbreaks. These would further clarify the expectations surrounding frequency of cleaning, products to be used and training of housekeepers.

VIHA has already implemented some environmental control programs, and I recommend these be continued and expanded. These programs include: the de-cluttering of hallways

through innovative storage systems; replacement of items that may spread infection because they are hard to clean; and modernization of bedside equipment.

Finally, my report includes suggestions made by individuals directly involved in infection control. These include improving surveillance methods to provide adequate baseline data on current rates of nosocomial infections, enhancing training modules for staff on the Infection Prevention and Control Program team, and strengthening evaluation of VIHA's current hand hygiene programs to encourage staff to wash their hands more frequently. Many of these changes would not necessarily require additional resources, but may need a change in hospital culture to maximize benefit to those served by our facilities.

I would be remiss if I did not acknowledge the efforts made by the VIHA team to manage the outbreak at NRGH, as the team dedicated significant resources and clinical expertise to this issue. My hope is that this report will build on the strengths of team and the learnings and observations made during the response to the outbreak.

A summary of all my recommendations is provided as part of this Executive Summary.

Respectfully submitted,



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Recommendations with none, or limited resource impact:

1. The Vice-President People, Organizational Development, Practise & Chief Nurse Executive and the Executive Vice-President & Chief Medical Officer serve as the intermediaries between the Executive and the Infection Control Team, especially during outbreaks within VIHA facilities.
2. Organizationally, Infection Control must be valued, both in practise and perception, as much as quantifiable services, such as those delivered by medicine and surgery.
3. Executive, Integrated Health Services and Infection Control Team commit to the creation of an outbreak protocol for VIHA. On its completion, all levels of the organization commit to following any and all assigned roles and responsibilities.
4. The Infection Control team participate in the IM/IT strategic plan for the next five-year cycle.
5. The Director, Emergency Management develops and implements a Hospital Incident Command System (HICS) specifically for the Infection Control team.

6. The Risk Manager for VIHA reviews this report and reports back to VIHA Executive and Integrated Health Services on his findings.
7. The Vancouver Island Health Authority hand hygiene practises are reviewed at the time of the Public Health Agency of Canada's Best Practises on Hand Hygiene publication this spring.
8. Nurse educators within VIHA assume a larger role in Infection Control education.
9. Promote Infection Control Practitioners' participation in undergraduate teaching, student placements and orientation of new staff members.
10. Engage the VIHA Research Help Desk to assist in defining the research questions and in identifying resources to conduct resulting study ideas.
11. The report is made available other Health Authorities, as requests already have been received asking for VIHA to share its knowledge and experiences as captured in this document.

Recommendations with resource implications:

1. Secure the services of a full-time Clinical Lead for the Infection Control team.
2. Hire a data analyst for Infection Control.
3. Review the workloads, roles and skill sets of Infection Control Aides. Once completed, populate facilities within VIHA with these infection control practitioner extenders in appropriate numbers.
4. Explore the purchase of the Cerner Infection Control module to compliment current island-wide IM/IT initiative. Fund the necessary modifications to have it work within the Canadian system. Assess how it could be integrated with Panorama (the new Public Health CD information system) for issues that involve both facilities and community settings.
5. As part of assertive contract management, maintain standardized metrics for frequency of cleaning, products used and training of housekeepers. These parameters should be enforced for both day-to-day activities as well as for outbreaks. If necessary, deploy additional resources to manage contracts so that the performance expectations are fully realized for VIHA's institutions.
6. Continue with environmental control programs such as the de-cluttering of hallways through innovative storage, replacement of items that could serve as fomites for spread of infection, and modernization of bedside equipment to avoid patient-to-patient spread by nursing staff (a major program instituted in Quebec's efforts to control C difficile).
7. Develop further capacity for management of community infection control issues (e.g. community infection control practitioners) to address issues that may have direct and immediate impact on facility infection control and vice versa (e.g. support for affiliated long term care facilities).

PURPOSE AND METHODS OF REVIEW

The Executive sponsors of this report are the Vice-President People, Organizational Development, Practice & Chief Nurse Executive and the Executive Vice-President & Chief Medical Officer. The report was prompted by the 2008 *Clostridium difficile* (*C. difficile*) outbreak at the Nanaimo Regional General Hospital (NRGH). The leaders of Vancouver Island Health Authority (VIHA) Infection Control (IC) and their team as well as external consultants from within BC were interviewed and contributed significantly to this Review. The objectives of this review are to:

- 1) Identify preventive measures for implementation to reduce the likelihood of a similar event occurring in the future at a VIHA facility.
- 2) Identify actions for Infection Control and other VIHA programs that will improve our system to prevent, detect and respond to similar challenges.

In conducting this review, the following sources of information were considered:

- Infection Control data from NRGH outlining the number of *C. difficile* cases and the IC response
- The Office of the Auditor General of British Columbia Report 11: Infection Control: Vancouver Island Health Authority 2006/2007
- Report on NRGH *C. difficile* outbreak from Dr. BH, BC Centre for Disease Control, 2008
- Interviews with staff from VIHA Infection Control, BCCDC, VCH (see Appendix 1 for list of individuals)
- Provincial Infection Control Network – BC:
 - i. PICNet Infection Control Guidelines for Home and Community Settings – Provincial Health Care to the Client Living in the Community (Draft 7)
 - ii. PICNet’s *Clostridium difficile* Surveillance Protocol
 - iii. PICNet’s 2008 Antibiotic Resistant Organisms: Prevention and Control Guidelines, November 2008
 - iv. PICNet’s “An Assessment of Infection Control Activities Across the Province of British Columbia” 2006
- Accreditation Survey Report, Vancouver Island Health Authority Victoria, BC September 28 – October 3, 2008: Team Findings – Information, Management and Environment
- Investigation into Outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust, Commission for Healthcare Audit and Inspection, October 2007
- Executive Summary Action Plan Following Outbreaks of *Clostridium difficile* at Maidstone and Tunbridge Wells NHS Trust For the Period October 2005 – September 2006, December 2007

- Patterns of antibiotic use and risk of hospital admission because of *Clostridium difficile* infection. SD, AK, AD, AB and SS, CMAJ 2008 179: 767-772

BACKGROUND

In June 2008, an increase in *Clostridium difficile* infections was reported at Nanaimo Regional General Hospital (NRGH). This increase continued through to September 2008 despite application of enhanced infection control (IC) measures. Prior to June 2008, the 2006/07 Auditor General's Report (AG Report) makes reference to an increase in *C. difficile* that occurred at NRGH in 2003 through 2004.

The AG Report identified a number of challenges and made a number of recommendations that remain relevant to the recent *C. difficile* situation at NRGH.

From 2003 to 2004, the number of cases of *C. difficile* per 1000 patient days was increasing at NRGH. A practise review determined eight actions that were to be taken – education, cleaning, disinfection, purchase of additional commode chairs of a special design, purchase of washer disinfectors for bedpans, purchase of a commode/wheelchair washer, reduction of broad-spectrum antibiotic use and the implementation of an electronic indicator in the laboratory to track positive reports. As each strategy was implemented, the number of nosocomial *C. difficile* cases was monitored. As practice changed, the rate dropped dramatically (Auditor General of British Columbia Report 11: Infection Control: Vancouver Island Health Authority 2006/2007, P39).

The findings were used to create tools, including education self-learning modules, an information brochure for patients and families, and an Infection Control check list for a patient's Kardex (distribution to management within Central Island). (Ibid P39-40) In its response to the AG report, the Health Authority (HA) highlighted the challenges in meeting IC facility guidelines given the HA's inventory of older buildings in which care was being provided. The HA response goes on to state "it also recognizes the need for consistent, on-going monitoring practises such as housekeeping services, hand washing and precautions and practices to that end is examining best practises in other jurisdictions with a view to adapting and implementing already developed and initiated audit tools and processes". It further states, "one example of on-going monitoring of practise is the evaluation of the effectiveness of interventions in relation to the *Clostridium difficile* associated diarrhoea (CDAD) at NRGH." The intervention program included educational sessions for nursing staff emphasizing the need for contact precautions when diarrhoea is observed, enhanced environmental cleaning with hydrogen peroxide and subsequent disinfection with bleach, introduction of stainless steel commodes and facilitating cleaning/disinfection, and reinforcement of IC principles. The introduction of these interventions resulted in a significant decrease in CDAD cases over a 17-month period from 19/1000 admissions to less than 5/1000 admissions. The HA reported that there were no cases in the last eight weeks of monitoring. Collaboration with programs to meet their IPC needs will include input into program self-assessments, completion of on-site audit and provision of surveillance data interpretation. The program will continue to support evidence-based practise change using a variety of strategies based on need and capacity. A number of monitoring mechanisms are available for contractors to report incident, activity and infections to the Vancouver Island Health Authority (VIHA). Work

is underway to standardize the contract language and clarify expectations. There is a mix of contracted and in-house housekeeping services in the health authority and both services are audited, using external auditors. There also needs to be an increased recognition of the importance of housekeeping services and products used, play in supporting infection prevention and control practises throughout the organization.” (Ibid P57-58)

In response to the need for surveillance information to identify outbreaks, the HA also indicated, “real-time infection monitoring and control in the acute care setting will be supported through VIHA’s primary clinical information system, Cerner. Cerner is currently used in South Island acute care facilities and will be implemented across all acute care facilities in the region by mid-fiscal year 2008. The Integrated Clinical Information System will provide access to all patient demographic information, laboratory results, diagnostic reports, transcribed reports and the complete medication profile. This core set of clinical content will be available to all authorized users across care settings. The implementation of alert and tracking tools to support infection prevention and control are planned as part of the Clinical Documentation Project approved in VIHA’s IM/IT strategy.” (Ibid P53)

An issue identified in the Auditor General’s report was that South Island Infection Control Practitioners are able to put data accessed through Power Chart into their own IC database. The Infection Control Practitioners in South Island generate tracked and trended reports. However, the process is described as very time consuming taking Infection Control Practitioners (ICP) away from other duties. As one interviewee put it according to the report “there must be an easier way to know what is happening”. (Ibid P35)

The Auditor’s report identified opportunities for improved hand hygiene. (Ibid P26) The Health Authority committed to an appropriate program of activities and monitoring.

In conducting the review, based on national recommendations, the Auditor General’s report indicated that at the time of the review there were 6.25 FTE’s functioning as Infection Control Practitioners in VIHA and this compared to an estimate preferred ratio being 15.6 FTE’s. (Ibid P14)

Finally, as has been observed in other jurisdictions, there is the need for an integrated approach to infection control for the Health Authority (Ibid P4).

In 2006, NRGH experienced a Norovirus outbreak involving much of the institution. IC discussed the incident command model with the local Medical Health Officer. The idea of deploying this approach to bring the outbreak under control was considered to have merit but it was not adopted according ICP’s.

At the time of the 2008 NRGH *C. difficile* outbreak, a new more virulent strain of *C. difficile* had emerged. This strain is associated with ribo type 001 clone and is more commonly referred to as the Nap 1 Strain. This more toxic strain of *C. difficile* was

associated with the nosocomial crisis in the Province of Quebec where it was implicated in contributing to hundreds of deaths¹. This particular bacterium continues to evolve and a hyper-toxogenic ribo type 027 clone has been recognized in eastern Canada recently. A previously unwelcome but manageable nosocomial infection has seemingly evolved into a potentially deadly hospital-acquired infection. A particularly troublesome feature of this bacterium is that when threatened with drying, the microbe may produce high numbers of infectious spores that enter the surrounding environment and persist for protracted periods of time. This attribute poses particular challenges in terms of eliminating the microorganisms from the physical environment. Their destruction is best accomplished with a concentrated solution of bleach.

In June of 2008, NRGH experienced a significant rise above baseline rates of *C. difficile* and by the end of August 55 patients had been identified with *C. difficile* associated diarrhoea. The Executive Medical Director, Quality & Patient Safety, at one stage, did suggest that an incident command approach be instituted to manage the outbreak. There were also challenges in communicating information about the situation during the *C. difficile* outbreak. Specifically, in August 2008, the Communications team was criticized by Nanaimo's media because of a perceived lack of information being relayed to the public. The circumstances leading up to the criticism arose from a misunderstanding during an interview with a clinician. When the interviewee was referencing issues with professional communications within the hospital, the reporter misconstrued the intent and reported it as problems with communicating with the public. The ensuing flurry of negative publicity arose largely from this misinterpretation. Nevertheless, the experience underscored the importance in having clear communications in the event of an outbreak.

In response to the *C. difficile* situation at NRGH, consultations by VIHA Infection Control staff were held with Dr. Michele Alfa from Winnipeg and Dr. Lynn Schulster from the Centres for Disease Control in Atlanta. As well, Dr. EB, a microbiologist from Vancouver Coastal Health Authority was contacted to share her experiences with a six-month outbreak at the Lion's Gate Hospital in Vancouver. In addition, Dr. BH from the BC Centre for Disease Control (BCCDC) was asked to perform a review of the situation at NRGH. Dr. MT, a community medicine resident attached to BCCDC and Dr. KD, a Field Epidemiology with the Public Health Agency of Canada (PHAC), assisted Dr. H in this review.

Dr. H identified many of the same challenges as the Auditor General's report. NRGH is an older facility with four-bed wards with a single shared toilet or sets of two-bed wards with a common toilet again for four patients. The issue of negative pressure rooms and appropriate isolation was raised. Other environmental challenges associated with the physical plant were detailed. While the need for good hand hygiene was recognized, the acceptance and availability of opportunities to engage in appropriate hand hygiene

¹ Of note, testing for NAP 1 toxogenicity started in November 2005 in British Columbia and ran for a year on an experimental basis. It was not until March 2008 that this test became more routine in BC. At that time, it was determined that 75% of cultures from the Lower Mainland were positive for NAP 1 but only 30% of Vancouver Island cultures were positive for this strain of *C. difficile*.

appeared to be limited. The human resource issues identified in the Auditor General's report were restated as well as the challenges of having sufficient and appropriate housekeeping staff to address environmental control issues. Issues with surveillance and laboratory reporting were also identified.

Seemingly, the mitigation measures applied after the 2003-2004 outbreak did not protect against what proved to be a more virulent and toxic strain of *C. difficile* infecting NRGH patients.

The Province of Quebec has experienced a *C. difficile* outbreak of the same strain that swept through its institutions. The emergence of *C. difficile* as a serious nosocomial infection occurred a year earlier in a community hospital on the South Shore of the St. Lawrence River. The St. Mary's Hospital outbreak shared a number of similarities to Nanaimo Regional General Hospital's 2008 outbreak. The details of the Quebec experience has been posted on their public health website but it is not translated into English at this time. An ongoing review of the "grey" literature of this global problem coupled with a systematic approach and evaluation of current practices may be the most effective approach to take in an area with a paucity of established best practices.

On the basis of what was experienced at NRGH, the experience of Quebec and an examination of the peer reviewed literature, a fully functioning and integrated Infection Control team provided with the appropriate supports will be required if future outbreaks are to be successfully managed. The experience of NRGH and its similarities to the experience of St. Mary's Hospital in Quebec in 2005, should serve as a general early warning to the rest of BC.

A recurring theme and potential impediment to improving Infection Control is that prevention practices within institutions are often trumped by the tyranny of the urgent. Moreover, measures achieving cost avoidance are not seemingly as valued as units of service or cost pressures associated with controlling/preventing outbreaks. Compounding matters, the more successful and integrated a regional Infection Control team is, the less likely the need for their resourcing being obvious, or similarly complying with their suggested interventions. Justification for the bolstering of Infection Control within the Health Authority may achieve greater acceptance if made on a risk-management basis. The consequences of lapses in IC practices are grave as evidenced from the 'price' paid in jurisdictions where failure to act occurred. While the Quebec outbreak reflects Canadian vulnerabilities, the extent of the potential problem is captured exceptionally well in the Health Care Commission's investigation of outbreaks of *C. difficile* at Maidenstone and Tunbridge Wells Trusts in the United Kingdom. Moreover, on the basis of economics, the costs associated with the NRGH outbreak are considerable. Dr. H's report contains suggested costs of failing to contain CDAD being measured in patient's requiring longer hospital stays, additional diagnostic and/or interventional procedures and subsequent re-admission. Hospital expenditures can be as high as 50% more with CDAD patients than non-CDAD patients with the same conditions. Ensuing multiple readmissions of CDAD patients can result in direct costs of over one hundred thousand dollars per year, per facility.

Observations and Suggestions:

The following is a summary of key challenges that were identified by interviewees during this review.

As might be expected there are divergent opinions on how some issues should be addressed. This may, in part, be explained by a paucity of best practices for IC. A reconciliation of positions was not undertaken, for the differences also serve to underscore some of the challenges that will have to be overcome in creating an integrated and fully functioning Infection Control Team.

Infection Control Team

ICP Ratios

The Office of the Auditor General of British Columbia (AG) report failed to take into the account the geography of the Health Authority. Also, the number of ICP's suggested in the report is reflective of what might be an expected ratio for an urban hospital complex. Moreover, the staff ratios of 1 to 150-bed ratio referenced in the report are not reflective of today's increased needs and challenges associated with emerging pathogens. Another factor that should be considered in arriving at a ratio is the need for greater numbers of ICP's with the system's aging infrastructure. VIHA is providing care in many older buildings. The increasing complexity of the patients being managed in facilities that were originally built as community hospitals and the involvement of the Health Authority in long-term care adds to the demands. The actual number of individuals working as ICP's from the time of the AG's report has increased from five to nine but this is still short of the recommended 16 individuals. The number of ICP's currently in place reflects the staffing allocation for this function and only was achieved in the last six months. This number is only for acute care and does not reflect the deployment of an individual to long-term care. This situation is made even more complex with some facilities providing long term care in the region being more closely involved with VIHA than others – affiliate versus amalgamate, and consequently, differing intensity of IC involvement.

Some Infection Control team members suggest that there is no certain or correct number of practitioners.

There was a prevailing attitude that the current number of ICP's results in people working close to the margin and there is very little reserve to manage an outbreak in an effective and timely manner. There is a great concern about staff burnout during protracted outbreaks given current day-to-day workloads and the inevitability of outbreaks in the future.

Observations and Suggestions:

1. An increased number of Infection Control Practitioners is needed for the HA overall. At a minimum, the complement should be the 16 individuals recommended in the AG report.
2. One FTE is needed for the west coast of the Island and one FTE for LTC for Central VIHA.
3. Additional IC practitioners are needed for managing community Infection Control issues; such as in affiliated long term care facilities. These positions would be part of the VIHA communicable disease program.
4. With an increase in the numbers ICP's with a concurrent addition of ancillary positions (such as data analyst and/or Infection Control Aides), an opportunity

for re-engineering of the role of the ICP may present and allow for some degree of specialization within the team. By way of example, the Infection Control Practitioner could provide additional focus on developing educational programs and mentoring students.

Scope of Practice

A concern was repeated about not being able to participate in Infection Control activities other than ward/department driven work especially during outbreaks. Specifically with the current compliment of staff, the work pressures on the various wards and departments even during non-outbreak intervals preclude other key functions such as surveillance and education. There is no effective surge capacity. Generally, IC is viewed primarily as a reactive rather than a proactive program.

The addition of Infection Control Aides has been a boon to the program and they have assumed some critical functions that previously had been fulfilled by Infection Control Practitioners on an ad hoc basis.

The Infection Control Aides are only a temporary measure at NRGH, having been brought in to address the outbreak situation in Nanaimo. These individuals are being funded from the IC Executive Director's budget and are dealt with as a run rate issue.

Observations and Suggestions:

5. The Infection Control Aide positions need to be made permanent and this adjunct to the team made available Island-wide to Infection Control Practitioners.

Target programs to locations where benefits would be greatest and most needed in order for the IC team to demonstrate small successes.

Data Analyst/Epidemiologist

A data analyst could assume responsibility for some of the duties currently performed by the IC team but also improve data quality and surveillance. A full-time epidemiologist to assist the program is another option. (It is unclear what the role of the Executive Medical Director, Quality & Patient Safety would be with this individual given their background in this subject area).

The South Island Medical Microbiologist is currently reviewing the 500+ reports that are generated daily by the Island-wide Cerner system, and in some ways is fulfilling one of the functions of an IC data analyst.

Observations and Suggestions:

6. Acquire a data analyst.

Site Administrator

The Infection Control team, particularly in an outbreak, needs to have the attention and support of the facility site director. This role is but one of many ongoing and competing responsibilities of the Site Administrator

Observations and Suggestions

7. There must be some provision in the event of an outbreak to make the site director available to the IC team and coverage provided for his or her other managerial functions. (It was suggested that the Executive Vice-President & Chief Operating Officer arrange coverage for the appropriate Executive Director under such circumstances).

The Team

There was general consensus that a standardized approach Island-wide to Infection Control is critical.

There is general acceptance and respect of the talents and skills of the various team members. On the other hand, there are issues surrounding role clarity and occasional differences in philosophy and personality. There was a sense that there was a lack of a common purpose on the part of the IC team. Moreover, senior medical leaders were very busy and IC is not their exclusive focus. The South Island may have a slight advantage on the rest of the Island in terms of a more established and sophisticated team.

With better team functioning, meetings would be more productive and the meetings would be more focused on tasks at hand rather than dealing with a variety of competing agendas and tangential topics, resulting in participants being distracted from the task at hand.

Infection Control, at times, appears to be arrogant and detached from the exigencies of trying to deliver a service within finite resources. The team does not seemingly appreciate the fiscal challenges facing the Operations portfolio. Specifically, support services are systematically being looked to for additional cost savings and this is at odds with the additional requirements being made of housekeeping by Infection Control for both routine and outbreak services. There also is frustration and confusion being experienced on the part of Operations with the phenomenon of a wide variety of opinions offered by the Infection Control team for any given topic. In addition to what are often conflicting responses from various team members, is the apparent dearth of research that supports any specific best practise recommendation from the team. Individuals on the IC team also did not appreciate the impact that their behaviours had on the support services around them such as the laboratory. Consistency in approach to any IC issue is required.

Operations and the by way of example needs to be involved in the process. Decisions and recommendations cannot be made in isolation by the IC team.

Observations and Suggestions:

8. Bringing in a new leader for IC whose sole responsibility is IC for VIHA. The new chief of Infection Control team should then focus on re-formulating a better-integrated team. When achieved, it is anticipated that improved performance should be associated with this change.
9. The team and some of the key individuals/departments with whom they interface could then participate in an externally facilitated session conducted by someone as skilled as LT to further the development of a truly integrated IC team.

Role Clarity

General

A recurring theme was that prevention is perceived as outside the acute care system, and this, especially for Infection Control, is not the case.

IC is seemingly at odds with bed control during overcapacity management. During times of overcrowding and overcapacity, IC is frequently viewed as an inconvenience by staff. (To meet Infection Control requirements and specifically deal with the commode issue during an outbreak, census often needs to be reduced in four-bed units to three to allow for proper toileting). Staffing shortages in the institutions during these challenging events as well as IC expectations contribute to the tension.

Senior Executive

The difficulties around role clarity seemingly arise from the governance model being poorly understood. This observation applies for both individuals within the organization and those external to the organization.

With any given situation that escalates within the Health Authority, ever more senior administrators become involved. It is critical that there is clear role definition for these individuals within the scope of such events. A number of interviewees placed great emphasis on the importance of role clarity across the administrative and clinical spectrum, including members of the Senior Executive. It was appreciated that the Executive has an important role to play in any outbreak, but proposed that its primary function should be supportive. External interference, no matter how well meaning, detracts from outbreak management. It was suggested that outbreaks should not be over-managed from afar and that an extreme top down method of management be avoided. Without appropriate role definitions and acceptance of these roles, the mixed and conflicting signals from individuals in leadership roles can result in imperfect decisions surrounding outbreak management. With clear role definition, the likelihood of local team members being undermined by senior administration could be avoided.

Observations and Suggestions:

10. The role of the Executive should be to protect the integrity of the local team, for both day-to-day activities and especially during outbreaks. The Executive has an important role to play in any outbreak but that its primary function should be supportive.
11. The Vice-President, Organizational Development, Practice & Chief Nursing Executive and Executive Vice President & Chief Medical Officer could serve an important function as intermediaries between care providers and the Executive of VIHA in achieving this objective.

12. During an outbreak, there should be greater autonomy for individuals on site in deploying what works.
13. Develop an outbreak protocol to serve as a guideline to be deployed during an outbreak. The protocol would outline roles and responsibilities of various players (ICP staff, medical microbiology, site administrator, executive, operations) and a communications strategy (e.g. regular teleconferences) would be employed in the event of an outbreak.

Role of Infection Control

Role clarity is critical as a number of team members felt there was a blurring of responsibility as to whether or not the team had an operational role versus an advisory role for controlling outbreaks. From time-to-time, certain team members' hands on involvement in outbreaks lead to the misperception by facility personnel and others that the team is responsible for the management of outbreaks. The Infection Control group is advisory. Ownership of issues surrounding outbreaks rests with the Executive Directors and their Executive Medical Director counterparts in Integrated Health Services, not with either the IC team or with senior Quality Management personnel. At the local level, this responsibility similarly rests not with the team but with the specific ward or institution where the outbreak is occurring.

The Infection Control team members currently have no authority to re-allocate resources within the portfolios of Executive Directors other than IC in the event an outbreak and the necessary additional resources that may be required in controlling an outbreak reside in these portfolios. In general, cost avoidance does not have the same cache as does cost pressures, and avoiding or mitigating an outbreak is not deemed as equivalent in value by administration as through put.

Observations and Suggestions:

14. Integrated Health Services accept responsibility for Infection Control issues within their programs and for outbreak management on **and** across their services including resourcing around outbreaks. (Integrated Health Services is anything but integrated around outbreaks). The mechanism by which IC can call upon Integrated Health Services for additional resources in both outbreak and non-outbreak situations must be elucidated.
15. The roles of both the site administrator and that of the Infection Control team at the site of an outbreak needs to be reaffirmed. The IC team must function in an advisory capacity.
16. The Executive Directors of Integrated Health Services explore the underlying principles of the *Safety First* initiative in Nanaimo (some of the ownership issues surrounding Infection Control and outbreak management might be reconciled).

17. The Infection Control team has a role in risk management conveyance. They have a duty to inform the Integrated Health Services membership as well as the Senior Executive as to the consequences of not following IC recommendations.

Role Definition – General

Observations and Suggestions:

18. Through a process of defining role clarity establish whose role and under what authority is an outbreak (once definitions are established) declared and who makes the decision that the outbreak is over.
19. Determine what decisions can be made locally and in a timely fashion. (The IC team called for ‘nimble’ responses in the event of an outbreak).
20. Responsibility for both internal and external communication needs to be clarified for the team. (Dr. H’s report has seen limited distribution within Infection Control and the document has been with some team members since mid-October).
21. Death reviews associated with nosocomial infections would best be left to the Executive Medical Director, Quality & Patient Safety rather than physicians who may have either been directly involved in the care of such patients or been consulted on their care.
22. The “gatekeeper” function of the Chief of Laboratory needs to be recognized as being critical to maintaining a finite resource. (With appropriate notification and involvement during the course of an outbreak, this individual can have a positive influence on both timeliness of testing and reporting).
23. It would be beneficial if the roles of local Medical Advisory Committees and the Health Authority Medical Advisory Committees were delineated as to quality generally and antibiotic stewardship specifically.

Hospital Incident Command System

This approach was suggested in 2004 for the Norovirus outbreak at Nanaimo and the Medical Health Officer, Central Island collaborated with the Infection Control Physician in exploring this course of action. It was suggested that while HICS was not implemented for the outbreak, its consideration was a positive step in defining future role clarity for critical events like outbreaks.

Using an overcapacity approach to organizing a response to an outbreak would take management of an outbreak out of being exclusively managed locally and guarantee senior management attention. However, the overcapacity protocols are being implemented so frequently in the HA, that the sense of urgency around their implementation is at risk of dissipating and not securing the needed attention. Moreover, there is potential for HICS approach to be more robust.

Team members were highly supportive of having a Hospital Incident Command System (HICS) package prepared specifically for Infection Control, as it would not only serve to help clarify roles but also provide opportunities to refine outbreak response.

Observations and Suggestions:

24. A HICS training module be developed for and tailored to the needs of the Infection Control team.
25. The participant list for HICS should be inclusive as possible.

Surveillance

There is inadequate baseline data for nosocomial infections.

All cases of diarrhoea in an institution, not just the ones that may be pathogenic or hospital acquired nosocomial infections should be reported to the ICP's.

Good numerator and denominator data needs to be secured to better understand what is occurring within VIHA's institutions.

While Nanaimo has been the focus of this review, it has been suggested that because of incomplete surveillance, high rates of nosocomial infections at other facilities are seemingly going unnoticed, for example rates at the Westcoast General Hospital.

St. Joseph's Hospital is a veritable blind spot in surveillance. One of the IC team members will be serving as a consultant at St. Joseph's Hospital and so some additional surveillance insights may be generated from this individual's involvement at that site.

A general observation has been that information and data are collected either by chance or by choice. In part, the problem arises from some data only being gathered from time to time while in other circumstances its collection is either mandated or systematically secured. There is a considerable workload associated with good data collection as part of surveillance. Some team members were concerned that the IC team had neither the time nor the expertise to address current surveillance and needs.

Current confusion around outbreak definitions and their application was exemplified by some clinicians stating that the outbreak was over on the basis of direct observation while other members of the team relied upon lab reporting periods to have confidence in resolution of the outbreak.

Observations and Suggestions:

26. Review of data needs, data collected and data utilization needs to be performed. The process needs to be inclusive for both acute care and long-term care facilities.
27. The responsibility for data acquisition across the Health Authority as well as the degree of processing of such information and the correlation of this compilation with other data sets must be delineated. Surveillance data from the institutions needs to be linked with that of the community and other jurisdictions within the province.
28. There needs to be concise case definitions for all of the nosocomial infections.

29. Analogous, standardized metrics for hospital infections need to be developed (if not already established) and collected to allow meaningful comparison.
30. There needs to be clearly defined starting and ending points for outbreaks.
31. These starting and ending points for outbreaks may need to be adjusted for local circumstances without compromising Island-wide consistency. The current staffing mix in different facilities and the varying ages and design of our buildings would necessitate such a construct.
32. There should be Infection Control charts for each ward.
33. Death reviews need to be conducted using standardized criteria in an effort to understand aetiology as well as attribution. In order to attribute death to a *C. difficile* infection, one needs compelling evidence of aetiology such as sigmoidoscopic confirmation of colitis. (It was been suggested that the Executive Medical Director, Quality & Patient Safety, given his epidemiologic background, assume the death review function).
34. Establish an Island-wide Infection Control surveillance system (this is not just about an IM/IT system e.g. Cerner) Define objectives, define data elements and how to be collected, define database type and where it will reside, protocols for analysis (frequency of analysis, types of analysis, types of reports, analyzed by who, interpreted by who, results distributed to who for action by who).

Hand Hygiene

The Health Quality Council has noted that hand washing rates are low and do not substantively improve even when individuals know that they are being observed as part of a study. It was at the Quality Council that the determination was made to have a limited roll-out of a hand hygiene program.

Observations and Suggestions:

35. Data be collected on whether or not the program has been successful – surveillance of quality and a commitment to evaluation.

Information Management/Information Technology (IM/IT)

General

Infection Control, as a good corporate citizen, agreed to a delayed roll-out of the full Cerner program to 2010. With this delay, Infection Control continues to rely on manual entry as well as labour-intensive maintenance of flow sheets and other tracking of trend data that is paper intensive. It is anticipated that the full Cerner package will alleviate some of these pressures.

The Cerner rollout has been associated with Island-wide reporting and this is a significant improvement on what existed previously in providing a more fulsome picture of what was happening on the island for IC.

The current Cerner program, however, is very basic and that with the initial rollout there was a reduction in functionality. The situation has since improved.

There have been some initial tracking issues with Cerner but they are being resolved.

The laboratory rollout of Cerner will not be complete before March 2009. Post implementation, there may be an opportunity to re-direct resources to Infection Control needs from the purpose built lab component.

An opportunity does exist to extract additional data from the laboratory but this will take additional programming time to make appropriate modifications.

Observations and Suggestions:

36. Infection Control Practitioners should be provided with additional training on utilizing Cerner for epidemiologic and tracking purposes. (While the acquisition of additional skills by ICP's could reduce the need for the skills of a data analyst for IC, the additional workload on ICP's would be problematic.)

Functionality – External

The Cerner System is a purpose built system but has the potential for re-builds enhancing its utility.

The opportunity to “bolt-on” additional functionality is an avenue that could be pursued. Both of these options are available to the current Cerner System.

An Infection Control module being developed in the United States by Cerner has potential utility however the primary purpose of the module will be to meet US Centers for Disease Control (CDC) expectations. Because of nuances needed to meet CDC

obligations, minor modifications may need to be made to this module to adapt it to Canadian settings.

The Cerner model developed in the United States would be an improvement on the current Excel spread sheet approach being deployed by IC staff.

The Infection Control module being developed in the United States may not be available for consideration until 2010.

There was a difference of opinion as to the cost of the Cerner Infection Control module being developed in the United States.

Observations and Suggestions:

37. Explore the Infection Control module being developed in the United States by Cerner as an adjunct to the current system for IC.

Functionality – Internal

There was disagreement as to who should guide the IM/IT process for the IC team. One member of the quality team believed it was her responsibilities to meet with IM/IT representatives to further refine the product. It was the impression of other team members that this responsibility fell to an individual with clinical responsibilities and not managerial ones.

Observations and Suggestions:

38. Whoever drives the IM/IT process, this person initially should work in collaboration with the Medical Director, Medical Administration but ultimately it would be the Chief Information Officer who would be responsible for implementing changes. (Executive Medical Director, Quality & Patient Safety would largely be one of supporting the process.) The role may fall to a new chief of IC if this position is created and filled.
39. Cerner System needs to be enhanced to flag key data for Infection Control Practitioners.
40. Cerner ultimately should be able to fulfil other external reporting functions such as providing data to the BC Centres for Disease Control and the Provincial Infection Control Network.
41. The Cerner System must be able to map not only the patient type and status in our institutions but also the cleaning status at the room level for all facilities.

42. The Cerner System must be able to track the cleaning of rooms or whether special cleaning would be required for a specific room.
43. The Cerner System must be sufficiently robust to address a variety of Infection Control metrics. (Examples are available where criteria have been developed to assess surgical IC procedural effectiveness and these parameters are not yet included in the information gathered by Cerner.) Additional programming and upgrading of the database could overcome anticipated shortcomings.
44. Cerner should be able to link to community data sources. Data linkages to Pharmanet and antibiotic use within VIHA facilities need to be established.
45. Privacy assessments for any data sharing exercise will need to be undertaken. (This requirement is mandatory and at times labour intensive.)
46. Infection Control should be a participant in IM/IT's strategic planning for the next five-year cycle to ensure a fulsome appreciation of the requirements for a robust, integrated Infection Control program and delineate the timelines associated with acquisition of essential IM/IT features for IC.

Future Functionality

Future features of Cerner could include auto-notification through mailing and paging of clinicians of critical results as might become available occur during an outbreak. Also, there are a number of significant opportunities in terms of data extraction with the move to full electronic charting.

Laboratory

Nanaimo Regional General Hospital (NRGH) was chosen for performing tissue cultures as they have had experience with performing the test.

The repatriation of tissue cultures from BC Children's to Nanaimo Regional General Hospital was done to be able to validate the newer test procedure introduced in early 2008 at NRGH.

Tissue culture is associated with greater staffing requirements and longer lead times in obtaining results.

Molecular testing is being done in Vancouver and a commercial PCR test may be available in the very near future.

There was confusion surrounding the new test result reporting for *C. difficile*. The policy of only antigen positive toxin positive results being reported immediately to ICP's while remaining *C. difficile* results only being reported at the end of the day (or later) as part of the batch reporting was questioned.

Observations and Suggestions:

47. Guidelines need to be developed for the circumstances under which repeat testing will occur for *C. difficile* infections.

Lab Resources

There are resource challenges in meeting laboratory demands during outbreaks and routine day-to-day operations.

The increased demands associated with an outbreak have a ripple effect on all of the other laboratory operations.

Observations and Suggestions:

48. The Chief of Laboratories be involved in the course of IC managing an outbreak. (The Chief is pivotal to orchestrating the redeployment of resources to the outbreak as well as re-balancing routine lab work during an outbreak).

Antibiotic Stewardship

Antibiotic resistance cannot be avoided indefinitely, however HA's can slow the acquisition of resistance to antimicrobial therapy. A series of measures have been identified and instituted in other locale in Canada to achieve this end.

Observations and Suggestions:

49. There should be a better coordination of interested parties in addressing antibiotic stewardship before any additional resources are deployed. Specifically, the Manager of Clinical Programs, the Medical Microbiologist and the Executive Medical Director, Quality & Patient Safety need to engage in a collaborative planning exercise prior to the allocation of additional resourcing.
50. Any initiative in antibiotic stewardship needs to expand beyond the South Island.
51. An 'academic detailing' approach be used to transmit information on an important subject as antibiotic stewardship. This is deemed, by some, as a superior approach; and that traditional educational programs tend to attract individuals whose practices are already displaying in the desired behaviours.

Communications - Internal

The external review of the outbreak by BCCDC identified a number of the issues affecting internal communications ranging from selective distribution of information to a basic misunderstanding as to the purpose of the review document from BCCDC.

Some of the materials circulated at the time of the outbreak, appreciating that they were prepared under tight timelines, at times added to the confusion rather than alleviating it.

Observations and Suggestions:

52. Protocols for communications should be clearly documented (e.g. as part of an outbreak protocol) – who will notify whom of what, in what time frame.
53. Communications from the Infection Control team need to be not only concise and highly readable but also produced in a timely fashion.
54. Communications personnel need to be kept in the loop, not only in the event that knowledge of events could become public through the media but also to assist in keeping staff, patients, volunteers, contractors and visitors informed during an outbreak.
55. As with surveillance, there needs to be clearly communicated and understandable benchmarks as to when to escalate a situation to declaration of an outbreak and when such an outbreak is declared over.

Communications – External

There must be greater transparency about what is happening within our institutions and especially at the time of outbreaks.

Observations and Suggestions:

56. Develop a colour coding approach to indicate the outbreak status of any particular facility. With a specific colour, certain precautions will be in place at the facility and as one escalated to a declaring an outbreak; a condition red would be declared. The outbreak status, posted on the VIHA web site much like the boil water advisories, would regularly be updated. (VIHA has such a system in place currently for long-term care facilities for norovirus and influenza-like illness (ILI) outbreaks.) The VIHA web site would also detail the associated policies for visitors and patients associated with each 'stage' leading up to a declared outbreak. There also would be links to quality information.
57. While it is critical to impart a sense of urgency in controlling an infectious outbreak, the messaging should not scare the public with excessively dire language or pronouncements in describing an outbreak.
58. The Health Authority should strive to promote appropriate hand hygiene within the community. Having public health nurses instruct school children on proper hand washing would be one avenue.

Risk Management

Risk Management is aware of the Auditor General's Report and VIHA's response.

The experience of other jurisdiction's efforts to address nosocomial infections provides a context against which to judge our response.

There needs to be an organizational position on Infection Control standards.

Adopting best practises is one of the most productive ways to truly mitigate risk. At issue will be whether organizational IC standards will be consistent with best practise or at some level below this.

The application of an enterprise risk management approach in the course of dealing with an outbreak has shown merit. An organizational risk analysis of the entire spectrum of issues for IC such as whom, where, how and how much during an outbreak could provide valuable insights. Mitigation of the risks associated with an outbreak rests with housekeeping and Integrated Health Services.

Observations and Suggestions:

59. Risk Management reviews this report to ensure VIHA is in a position to demonstrate due diligence for IC practices and report back his findings to Senior Executive and Integrated Health Services. Should best practices in IC not be realizable, the organization needs to be in a position to defend any decision from a risk management perspective.
60. An enterprise risk management approach is judged a component of outbreak management.
61. IC needs to engage Risk Management in the course of reporting out to Senior Executive and Integrated Health Services on IC risks for the organization.

CME/Infection Control Promotion

It is critical that all staff within our facilities accept Infection Control practices and, through the acquisition of information and education, have additional IC measures instituted.

General hand washing promotion is not universally embraced within the Health Authority. Not all members of the Infection Control team are convinced of the effectiveness of hand hygiene. At the present time only two VIHA sites have been approved for an intensive campaign of hand hygiene and IC is to determine the impact the targeted programs will have on a variety of IC outcomes in the designated locations.

External consultants pointed to a variety of hand hygiene programs being conducted in locations such as Ontario.

The Public Health Agency of Canada will soon be releasing a Best Practises document on this subject.

To promote Infection Control practises, the *Safety First* Program was developed in Nanaimo. This pragmatic initiative would best be described as promoting enlightened self-interest. The intent is that one does not bring one's 'work' home with them. By practising good Infection Control at one's place of employment, one avoids contracting various infections that could not only result in personal sickness but also be spread to one's family. It is anticipated that with acceptance of the program within a facility that there will be an ensuing positive change in facility culture favourable to IC recommendations.

The far-reaching benefits of adopting the principles of *Safety First* by Integrated Health Services could best be illustrated by the following scenario: if the Emergency Department does not adequately screen its clients for norovirus, this infection is transmitted to the wards. Once an outbreak occurs within the hospital, beds are blocked and the Emergency Room experiences a reduction in its ability to place patients, which compounds the overcrowding in ER and further spread of norovirus within the ER.

Safety First that has potential to have impact Island-wide. Not will not only could individual practises be affected but the program could also result in a spill over to other aspects of Infection Control such as cleanliness of equipment and keeping clean and dirty items separate.

Observations and Suggestions:

62. VIHA practices should be reviewed within the context of the Public Health Agency of Canada's Best Practises document on hand hygiene.
63. Review the merits of a broader application of *Safety First* within VIHA, including a cost-benefit analysis.

Despite the reported success of *Safety First* in Nanaimo, there still appears to be some resistance to Infection Control principles from long serving staff whose career commencements pre-date the immergence of many of the present day serious nosocomial infections. It was emphasized that acceptance of educational messages is greater when professionals of equal status deliver the program. By way of example, Infection Control Aides are not well positioned to ‘educate’ nursing personnel.

Observations and Suggestions:

64. Nurse educators/leaders within the various institutions are looked to take on the roll of convincing colleagues as to the merits of the IC practises being recommended.

The Infection Control Practitioner at Nanaimo Regional General Hospital enters specific Infection Control orders on patients’ charts with the concurrence of the attending physicians. The nurses on the ward treat these orders as written on behalf of physicians and comply with this direction. The Infection Control Practitioner also provides notations in the progress sheets as to the rationale for the recommendations.

Observations and Suggestions:

65. Review role of such a practice within the HA.

It was emphasized that in advancing the principles and practises of Infection Control it is critical to influence students and new grads.

Observations and Suggestions:

66. Involvement in undergraduate teaching, ward student placements and orientation of new staff members is supported and encouraged.

The approach to educating health care providers on antibiotic stewardship is undertaken with a careful consideration of the effectiveness of current approaches to continuing professional education.

Observations and Suggestions:

67. Avoid having formal courses for physicians on antibiotic stewardship, as attendees will likely already be engaged in Best Practises by-and-large. For this audience, it likely will be an opportunity to refine rather than change practise.

Research

Observations and Suggestions:

68. A case control study of the current outbreak in a similar format to that of the *Canadian Medical Association Journal* article in October 2008 is performed.
69. A complementary study to the case control study be conducted wherein the focus would be on patients entering and leaving the institution. This baseline prevalence study would serve as an important benchmark for tracking not only the emergence of outbreaks but also could serve as a measure of the success of quality initiatives in Infection Control.
70. More basic epidemiologic research needs to be conducted within VIHA; studies would address institutional and community factors.
71. While research is to be viewed as a desirable activity by Infection Control, participating in such endeavours should not distract the team from addressing the primary challenges of an outbreak.
72. Engage the VIHA Research Help Desk to assist in defining the research questions and in identifying resources to conduct the study.

Environmental Controls

General

An external consultant and many members of the team identified the issue of NRGH being an older facility with a layout that makes Infection Control and housekeeping very challenging. An IC team member expressed the opinion that having an older facility may, however, serve as a constant reminder to staff of the importance of Infection Control.

Cleaning services are essential to both the appearance of the facility and attainment of Infection Control objectives.

Housekeeping has been described as having the potential for being the weakest link in the Infection Control chain.

Housekeeping is an 'easy target' for problems in IC, and the housekeepers and contractor are not in a position to readily defend themselves against criticism.

Reductions in support services have been used to bolster acute care demands since the 1980's. The outsourcing of housekeeping in the early part of this decade was to allow money to be saved and reinvested in nursing personnel. Approximately 700 individuals in the HA lost their housekeeping jobs in the provincially driven re-organization. The new contract for VIHA however, was to provide for over 30 additional new full-time equivalents in housekeeping. Unfortunately, with the 'hot' labour market in the last five years, the contractor has had difficulty in achieving a full compliment of housekeepers at the \$10.50 wage initially being offered.

Of note, the contingent of individuals responsible for Infection Control at the time of signing the original contracts was not particularly well organized or influential. The number of and expertise of the individuals now delivering Infection Control services is considerably greater. Consequently, by today's standards and the expert review of current ICP's, the standards cited in the contract are inadequate. As well, other variables have changed – the population VIHA is serving is older, the patients in hospitals and in long term care are even more complex and of increased acuity, and the organisms being dealt with are nastier. During the term of the contract, standards for housekeeping have gone up provincially.

An IC team member pointed out that perception is reality with respect to housekeeping and the perception at Nanaimo Regional General Hospital is that the facility is dirty. Moreover, having an unclean facility impedes the Infection Control team's efforts to secure the cooperation of other staff in engaging in appropriate practices such as hand washing and avoiding the communal use of equipment.

In the course of delivering housekeeping services to the most critical areas of the institutions (and to ensure proper servicing of outbreaks and the highest-risk locations within facilities such as the operating room), the contractor has redeployed housekeepers

away from locations that enjoyed high visibility by the general public— entrances, hallways and other locations. As well, the original decision to assign a low priority to frequent and thorough cleaning of such conspicuous locations as the entrance of facilities has further contributed to the significant perception and public relation problems.

The Human Factors Assessment for the new patient tower in South Island is encouraging and progressive. However, if current housekeeping practices and staffing trends continue, bioburden will not only be an issue for VIHA's older facilities but eventually it also will build up in new facilities and outbreaks will start occurring in these settings.

In terms of overcrowding, a number of team members expressed that expediency in such circumstances trumps correct IC practices. In fact, some hospital staff view Infection Control as an impediment to optimizing the capacity of the facility but seemingly not acknowledging the significant risks associated with conveying such an attitude.

Observations and Suggestions:

73. Senior Administration needs to prioritize housekeeping and find a way to achieve a level of cleanliness required to avoid nosocomial infections.
74. The Integrated Health Services portfolio needs to accept responsibility for being operationally accountable for the cleanliness on their respective wards and departments. While Senior Executive may make Infection Control an organizational priority, the objective is ultimately attained through the efforts of the clinical Executive Directors and Executive Medical Directors.
75. The principles of Infection Control need to apply across the Health Authority, and include new buildings. Some practices, such as carrying bedpans through wards, need to be revisited.

Housekeeping - General

A major issue surrounds training and retention of staff. Unfortunately housekeeping positions are not viewed as a career path. ICP's viewed housekeepers as transient, and as a result, not factored into ongoing IC planning.

The current cohort of housekeepers experiences an extremely high turnover rate, upwards of 50% for some months. It seemingly was only after the hourly rate wage rose to \$13.00 per hour that the high turnover rate showed some improvement. As well, the recessionary times we are currently experiencing may see individuals remaining in their VIHA housekeeping positions for longer periods of time. This significant turnover is in contrast to that observed for the unionized employees who were terminated as part of the contracting out process. Those individuals constituted a fairly stable workforce whose numbers included many long serving staff. An opinion was offered that where former HEU staff have been hired into housekeeping jobs and are working on the same locations as they did prior to this change, housekeeping services are superior on these wards.

Some of the problems with service levels may have arisen from the contractor experiencing difficulties with the bottom-line. The contractor is in business and looks to returning a profit on its contracts. Managers and teams of the company are rewarded for attaining this goal. Consequently, one of the means by which housekeeping managers may have achieved desired business end points is through vacancy management – to the detriment of service delivery within the facilities of VIHA.

In terms of adequacy of housekeeping staff, the opinion was expressed that the numbers of cleaning staff that were brought to bear on the *C. difficile* outbreak actually represent what should be the normal day-to-day complement. Additional staff to this adjusted baseline would be required for outbreak management. The cost of improving housekeeping services range from an estimate of \$1 – 2 million provided to one ICP to as high as \$5 - 6 million dollars needed annually to bring up services to recommended levels for both routine cleaning and during outbreaks.

Observations and Suggestions:

76. The actual magnitude of the cleaning gap between need and current service level must be established and tracked.
77. A baseline for minimum safe staffing levels must be articulated and complied with consistently. This figure would be monitored for increases in compliment in response to any outbreaks or events.
78. While this is a contract management issue, given the importance of housekeeping, staffing surveillance by a number of the IC team is required. If additional personnel at VIHA are needed to ensure the terms and conditions of the housekeeping contract are fully and consistently met then they should be hired.

Housekeeping – Deployment and Skills

Changes have taken place in terms of the frequency of activity by housekeeping. By way of example, the cleaning of toilets, wherein once a day was deemed sufficient in the original contract, the frequency, in order to come closer to expected performance standards for Infection Control has been modified to have cleaning staff performing this activity every two-hours through the day.

The issue was raised as to a seemingly fixed staffing compliment being applied across the Health Authority when in fact different departments and settings have varying degrees of need. An inflexible approach seemingly does not reflect the reality of varying requirements within our various institutions.

A reoccurring theme was the education and training received by housekeepers.

The baseline training materials for the contracted housekeepers is superior to that which was received by the earlier, unionized workforce. However, the high turnover rate of the contracted workers seemingly negates this potential improvement in education. Nurses have indicated that they routinely need to provide more direction to the contract housekeepers on an ongoing basis, as these housekeepers are not necessarily familiar with the hospital or ward environment in which they are to employ skills and training. Moreover, the high turnover rate of housekeeping precludes the establishment of an ongoing relationship that would enhance service delivery. Questions were raised as to whether the material supplied by the contractor was studied by members of the housekeeping contingent. The Infection Control Aides have been attempting to work with the group in Nanaimo, an added benefit being that one of the two aides has a housekeeping background. However, undertaking such a function is outside of the mandate of the Infection Control team and is the responsibility of the contracted agency.

Observations and Suggestions:

79. A root cause analysis needs to be conducted in meetings between Operations and Infection Control.
80. Review outbreak needs of the IC team and compare to current contract performance expectations for facilities within VIHA. Once a baseline for day-to-day maintenance has been established, track the responsiveness of the contractor to differing situations - the frequency of cleaning for a variety of sites and for evolving circumstances such as outbreaks.
81. The cost of increased IC activity generally and outbreaks specifically should be covered for programs rather than having the programs be expected to absorb these costs within existing budget allocations.
82. There needs to be an opportunity for a mid-course correction of budget as overruns and needs are identified, with appropriate adjustment(s) to the base of future budgets.
83. Review the adequacy of the training for contracted services and conduct a real-time knowledge assessment of housekeeping staff.

Housekeeping – Outbreaks

The idea of having a SWAT team or specialized group to be responsible for specific functions already exists within the current contract. It calls for project teams being responsible for major thoroughfares/causeways and other locations within the hospital. While conceptually this should have resulted in improved housekeeping services, difficulties arose because these teams were never fully staffed. As a consequence, these improvements were not realized and the anticipated superior service never materialized.

Observations and Suggestions:

84. A designated group of housekeepers would have sole responsibility for designated rooms rather than general ward responsibilities as currently practiced.
85. The focus should not be on routine cleaning but rather ensuring that at discharge the appropriate terminal cleaning of the room takes place.
86. An outside group of cleaners, a veritable SWAT team come in and supervise and augment the efforts of general housekeeping.
87. There needs to be a housekeeping algorithm for outbreaks.

Environmental Audit

British Columbia is the only province to have instituted a standardized audit of housekeeping services. The provincial audit was not developed for Infection Control purposes but rather was an organizational mechanism to ensure that certain elements of the contracts were meeting objectives. Nevertheless, these audits could serve some utility for Infection Control on a limited basis. Each Health Authority engages in the audit on a pre-determined schedule and the findings do allow for comparisons. These single points in time do provide an opportunity to plot trends.

The minimum established for the provincial audit rating system is 85%. The Nanaimo Regional General Hospital (NRGH) usually scores in the mid 70's. However, when low audit scores are received for an institution, resources have been pulled from other areas to address deficiencies and the re-audit usually meets the expected 85% standard. Unfortunately, in correcting the shortcomings of institutions failing to meet grade, housekeeping services in facilities from where housekeepers have been redeployed experience suboptimal service.

The media (CTV) have already made a Freedom of Information request for the results of the provincial audits being conducted on housekeeping services. While the Vancouver Island Health Authority has secured the required minimum 85% score, individuals familiar with the process speak to not where VIHA has made the grade but the critical places where points were lost. A number of IC team members are not supportive of the provincial audit process for housekeeping with its scheduled audits but instead would like to see real-time, unannounced monitoring of actual practices.

Individuals on the Infection Control team have been generally supportive of surface culture for auditing cleaning of our facilities.

Observations and Suggestions:

88. Utilize those components of the provincial housekeeping audit that provide useful IC information and supplement with appropriate measures to fulfil IC's mandate.
89. Train IC aides to conduct real-time audits on housekeeping.
90. Culture of surfaces within various institutions could be used as an appraisal of cleaning practices. Moreover, on the basis of these findings, a checklist could be developed to ensure problematic areas are cleaned. This same approach could be used to validate the checklist by repeating surface cultures from time to time.
91. A complimentary activity to monitor housekeeping would be the use of ATP indicator testing. (This material is removed from test surfaces with proper cleaning techniques. When cleaning is inadequate, the material left behind fluoresces under ultraviolet light.) This latter quality assessment might serve to not only determine what parts of different rooms were missed but also whether they had yet to be cleaned.

Equipment

There have been some positive measures at Nanaimo Regional General Hospital in terms of environmental controls such the chair replacement initiative wherein fabrics were replaced with more easily cleanable vinyl materials.

A subject that was not only alluded to by external consultants but again identified by a number of individuals on the Infection Control team centred on the quandary of so-called 'orphan' equipment on the ward. Items included shared point-of-care equipment such as blood pressure machines as well as wheel chairs used in the transport of patients. The genesis of the problem centres on nurses having previously had responsibility for cleaning specific items. However, that responsibility had been negotiated away as a nursing duty in collective bargaining. Compounding the problem is the observation that many of these same items are not viewed as being the responsibility of the contracted out housekeeping services. On some wards there are ward aides that perform this cleaning, however, other wards are not staffed with these personnel, leaving a critical gap in cleaning. Of note, the Infection Control team have effectively utilized Infection Control Aides to service these 'orphan' items. Unfortunately, the Infection Control Aides are not a funded part of the Infection Control team compliment at NRGH. A number of these individuals are being resourced as an additional cost to the Program Director. The IC Aides are only located in two locations - the Nanaimo Regional General Hospital and the Royal Jubilee Hospital.

The conundrum of wards acquiring more and more equipment results in tremendous clutter on the wards. In addition to being a fire hazard, the ability to properly clean this

additional equipment is an ongoing challenge. Moreover, the requirement of adequate separation of clean and dirty materials in such circumstances is near impossible given the physical limitations of many of the older facilities within VIHA. Even with modern buildings there probably will never be enough space to accommodate all of the equipment that can be acquired in the name of good patient care.

To reduce clutter, patient locker space was reconfigured to gain additional ward storage at NRGH. Unfortunately, because of resource implications, this improvement was restricted only to the 5th floor despite the clutter being an issue throughout the facility.

Observations and Suggestions:

92. A sophisticated porting system could be deployed and serve to effectively remove some of the equipment clutter. (Such a solution would likely require additional resources.)
93. Extend the locker space reconfiguration program where feasible.
94. Address proper bedpan portering and washing needs.
95. In an effort to reduce bioburden, institute the practice of one microfibre mop per room and that the mop remains within the room. Also use microfibre cloths for general cleaning.
96. Keep clean and dirty materials separate.
97. Policies need to be developed to deal with “in-and-out” activities in VIHA buildings for staff, equipment, volunteers and visitors during an outbreak.
98. Responses that are developed should be nimble. Supplies for outbreak control need to be secured in an expedited fashion. Similarly, cleaning strategies for such events must be implemented in a timely manner regardless whether it is an evening or weekend.
99. In addition to securing additional equipment and supplies during an outbreak, there needs to be processes in place to ensure that appropriate supports are in place to ensure full implementation and utilization of these resources. Actions could range from making changes in the physical environment to additional training and oversight of staff.
100. The selection of cleaning agent(s) by the IC team – quaternary ammonium compounds, bleach or Virox, must be finalized and evaluated as to effectiveness. (There are concerns that the concentrations Virox being used are not based on published literature.) Island-wide standardized disinfection practices and preparations must be instituted.

101. Whether changes in a cleaning product(s) in the event of an outbreak are required should be reviewed and a consistent policy implemented across VIHA.

Systems Issues – External

Observations and Suggestions:

102. Regardless of the financing model utilized in securing housekeeping services, significant improvements in performance and staffing numbers are a pre-requisite for successful IC. Given the risk associated with inadequate housekeeping practises and the potential for spread of outbreaks beyone any one HA (as happened in Quebec), the opinion was expressed that concerns should be addressed not only at the HA level but also be a priority at the Provincial level.
103. Based on the learnings from the Quebec experience, the province should proactively fund measures shown to contribute to successful IC.

APPENDIX I

Interviewees:

BC Centre for Disease Control:

Dr. BG
Dr. BH
Dr. MT

Vancouver Coastal Health Authority

Dr. PD
Dr. RG
Dr. JC

Vancouver Island Health Authority

Executive Director, Portfolio C
Executive Vice President & Chief Medical Officer
Infection Disease Physician
Leader, Strategic Projects & Internal, Communications
Vice President, Operations & Support Services
Medical Director & Department Head, Laboratory Medicine
Medical Director, SIR VIHA Medicine, Administration
Medical Microbiologist
Corporate Director, Risk Management, Policies & Legal
Director, Infection Prevention and Control
Executive Medical Director, Quality & Patient Safety
Infection Control Practitioner
Executive Director, Quality & Patient Safety