



***Orientation Program
For
Infection Control Practitioners***

July 2012

Background

In April 2010 Provincial Infection Control – Newfoundland Labrador (PIC-NL) identified a need to have a provincial orientation program for Infection Control Practitioners (ICPs). A request for volunteers to participate in the development of this program was issued through the regional representatives of PIC-NL. In June a teleconference was held with the committee called the PIC-NL Education Subcommittee. Members were:

- Marion Yetman, Provincial Infection Control Nurse Specialist, NL
- Cindy Williams, Infection Control Practitioner, Labrador-Grenfell Health, NL
- Paula March, Regional Infection Control Coordinator, Labrador-Grenfell Health, NL
- Betty Anne Elford, Infection Control Practitioner, Western Health, NL
- Tracy MacDonald, Infection Control Practitioner, Central Health, NL
- Alisa Cuff, Infection Control Practitioner, Central Health, NL
- Sharon O'Rielly, Infection Control Practitioner, Eastern Health, NL
- Dr. Donna Moralejo, Professor, Memorial University of Newfoundland, School of Nursing

National representatives were recruited from our collaborations with the Community and Hospital Infection Control Association (CHICA)- Canada. These representatives were:

- Stacey Burns, Infection Prevention and Control Program Coordinator, Prince Edward Island Department of Health and Wellness
- Joanne Archer, Educator and Best Practices Coordinator, Provincial Infection Control Network (PICNet) BC
- Susan Cooper, Consultant, OAHPP South Eastern Ontario Infection Control Network, ON
- Laura Fraser, Consultant, OAHPP Erin St. Clair Infection Control Network, ON

A brainstorming session was held with the committee and nine modules were identified as being a priority for the orientation of a novice Infection Control Practitioner. These are:

1) Surveillance	5) Cleaning, Disinfection and Sterilization of Medical Equipment/Devices
2) Routine Practices & Additional Precautions	6) Outbreak Management
3) Microbiology	7) Communicable Diseases
4) Hand Hygiene	8) Occupational Health
	9) Construction and Renovation

Each module consists of learning objectives and suggested readings as well as five sections related to content: overview, key concepts, methods, documentation and reporting, and other issues. Multiple exercises are included to help the ICP summarize or apply key points or concepts. A suggested four-week schedule has also been included to help novice ICPs plan their orientation program.

Every effort has been made to reflect the most up-to-date evidence available at the time of completion of the document, June 2012

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Instructions for the Orientation Program

A successful orientation program needs to be well planned. This orientation program consists of nine modules developed by the PIC-NL Orientation Education Subcommittee.

At the beginning of the orientation period, the mentor and orientee must meet and discuss the orientation program. It is also suggested that at the beginning of each week a review of the activities of the previous week be completed and plans for the present week discussed. An overview *“Four Week Schedule – At a Glance”* (page 6) has been provided which can be customized to meet the unique characteristics of the organization and reflect the experience and knowledge level of the orientee. For example, the mentor in collaboration with the orientee may decide that the novice ICP has worked extensively in the microbiology department and does not require an orientation to the laboratory or to the microbiology module. They would then rearrange the suggested schedule to reflect this decision.

The days are divided into practice and theory responsibilities. In the practice component the mentor may want to focus on key practice standards for an Infection Prevention and Control (IPAC) Program. These include: i) infection prevention and control practice, ii) surveillance, iii) epidemiology, iv) education, iv) consultation, v) program administration and evaluation, vi) fiscal responsibility, vii) performance improvement, and viii) research. In the theory component it is suggested that the nine modules be used in the sequence that suits the individual’s priorities and program. One mentor may choose to do the Hand Hygiene Module first while another mentor may choose to do the Surveillance Module.

The *“Detailed Four Week Schedule”* (page 7) gives a checklist of activities. The checklist can help identify items which need to be covered during the orientation period. The mentor and orientee can modify each day’s activities to reflect the needs of their IPAC Program.

The next section includes the nine modules. These modules are practice focused so the orientee must do the readings and then answer the questions pertaining to the readings in order to meet the learning objectives. Each module has five sections:

- Overview: a brief introduction to the module is provided
- Key concepts: these concepts must be understood by the ICP in order to work in IPAC
- Methods : the key concepts are put into everyday work scenarios and will guide the novice through potential IPAC issues
- Documentation and reporting: this section allows reflection on the role of the ICP in documenting consultations done in the practice areas and reporting requirements for the specific areas such as surveillance and/or outbreaks
- Other issues: in this section any outstanding issues relating to the module are discussed

In certain modules, such as the Cleaning, Disinfection and Sterilization Module, a tour of a department is suggested. It is recommended that the mentor arrange this tour in advance and the specific module be reviewed prior to the tour. It is suggested that the person in the department be given a copy of the specific module so the specific activities can be planned.

An evaluation is included. The completed evaluation should be discussed with the mentor.

ICP Orientation Program

Four Week Schedule – At a Glance

	Day 1	Day 2	Day 3	Day 4	Day 5
Week One	Orientation to office routine and computer	Orientation to ICP position and tour	Daily ICP activities	Daily ICP Activities	Orientation to Practice Area
	Structure of IPAC program	Committees and resources	Surveillance Module Sections: 1 and 2	Surveillance Module Sections: 3, 4 and 5	RPAP Module Sections: 1 and 2
Week Two	Daily ICP Activities	Daily ICP Activities	Daily ICP Activities	Daily ICP Activities	Daily ICP Activities
	Microbiology Module: Sections 1 and 2	RPAP Module Sections: 3, 4 and 5	Hand Hygiene Module: Sections 1 and 2	Microbiology Module Sections: 3, 4 and 5	Hand Hygiene Module Sections: 3, 4 and 5
Week Three	Daily ICP Activities	Daily ICP Activities	Lab Orientation	Daily ICP Activities	Daily ICP Activities
	Cleaning, Disinfection Sterilization Module: Sections 1 and 2	Education Responsibilities Personal Learning Plan	Outbreak Module: Sections 1 and 2	Cleaning, Disinfection & Sterilization Module: Sections 3, 4 and 5	Complete any reports/assignments Review Orientation Program Identify skills/ education required
Week Four	Daily ICP Activities	Daily ICP Activities	Tour of MPD	Daily ICP Activities	Meet with mentor Review orientation program
	Communicable Disease Module	Outbreak Module Sections: 3, 4 and 5	Occupational Health Module	Quality and Risk Management	Construction Renovation Module

ICP Orientation Program

Detailed Four Week Schedule

Week One

Day 1: The focus of Day 1 is on becoming familiar with the office and functioning as an employee (especially if the ICP is new to the organization). Items to be reviewed include phone systems, key contacts and identification of learning needs relating to computers. The afternoon's focus is on the structure of the IPAC program with review of related documents and a tour of key areas of responsibility.

Activity	Comments
Morning	
Meet with Mentor Office orientation	
<input type="checkbox"/> Tour of immediate work area <input type="checkbox"/> Introductions to staff <input type="checkbox"/> Immediate work place issues <input type="checkbox"/> Name tag, parking pass	
<input type="checkbox"/> Administrative details <input type="checkbox"/> Manager <input type="checkbox"/> Hours of work <input type="checkbox"/> Reporting sick calls <input type="checkbox"/> Pay sheet <input type="checkbox"/> Vacation/vacation relief/time off <input type="checkbox"/> Ordering supplies <input type="checkbox"/> Business cards <input type="checkbox"/> Travel/expense claim forms <input type="checkbox"/> Request for education form <input type="checkbox"/> Pay cheque <input type="checkbox"/> Mileage if applicable	
<input type="checkbox"/> IPAC telephone, fax/page number location offices <input type="checkbox"/> IPAC caseload division and printer numbers <input type="checkbox"/> Land phone/fax pager <input type="checkbox"/> Voice mail <input type="checkbox"/> Internal phone lists <ul style="list-style-type: none">o Emergency Preparednesso Patient Care Unitso Public Healtho Emergency Response toll free line	
<input type="checkbox"/> IPAC staff contact information <input type="checkbox"/> Facility contact information; whom to call and when <input type="checkbox"/> After hours contact list	

Activity	Comments
Computers	
Determine access required and training needs	
<input type="checkbox"/> Computer programs used Meditec, Outlook, Word, Excel <ul style="list-style-type: none"> <li data-bbox="285 382 878 413"><input type="checkbox"/> Access for shared drives/directories/files <li data-bbox="285 413 878 445"><input type="checkbox"/> Literature searches – how this done <li data-bbox="285 445 878 477"><input type="checkbox"/> Internet access/intranet access <li data-bbox="285 477 878 508"><input type="checkbox"/> Helpdesk assistance <li data-bbox="285 508 878 540"><input type="checkbox"/> Computer training required <li data-bbox="285 540 878 608"><input type="checkbox"/> Access to site for paycheque, mileage and staff directory 	
Afternoon	
Structure of IPAC Program <ul style="list-style-type: none"> <li data-bbox="236 684 747 715"><input type="checkbox"/> Director (if applicable) <li data-bbox="236 715 747 747"><input type="checkbox"/> Manager (or Regional Coordinator) <li data-bbox="236 747 747 779"><input type="checkbox"/> Coordinator <li data-bbox="236 779 747 811"><input type="checkbox"/> Administrative assistant role <li data-bbox="236 811 747 863"><input type="checkbox"/> Other ICPs 	
<input type="checkbox"/> Organizational overview <ul style="list-style-type: none"> <li data-bbox="285 899 943 973"><input type="checkbox"/> Organizational chart (where the facility fits into the larger structure) <li data-bbox="285 973 943 1005"><input type="checkbox"/> IPAC structure <li data-bbox="285 1005 943 1036"><input type="checkbox"/> IPAC planning/reporting structure <li data-bbox="285 1036 943 1068"><input type="checkbox"/> Quality and risk responsibilities *(Week 4) <li data-bbox="285 1068 943 1100"><input type="checkbox"/> Public Health* (Week 4) <input type="checkbox"/> Budget	
<input type="checkbox"/> Introduction to IPAC position <ul style="list-style-type: none"> <li data-bbox="236 1184 904 1258"><input type="checkbox"/> Vision, mission, values, guiding principles and strategic objectives <li data-bbox="236 1258 904 1290"><input type="checkbox"/> Infection Control Practitioner position description <li data-bbox="236 1290 904 1322"><input type="checkbox"/> Other IPAC positions/responsibilities <li data-bbox="236 1322 904 1353"><input type="checkbox"/> APIC/CHICA-Canada Practice Standards <a data-bbox="236 1353 714 1385" href="http://www.chica.org/pdf/08PPS.pdf">http://www.chica.org/pdf/08PPS.pdf <li data-bbox="236 1385 518 1417"><input type="checkbox"/> ICP assignments <li data-bbox="236 1417 584 1448"><input type="checkbox"/> Facility responsibilities <li data-bbox="236 1448 584 1480"><input type="checkbox"/> Department coverage 	
<input type="checkbox"/> Reports <ul style="list-style-type: none"> <li data-bbox="236 1533 502 1564"><input type="checkbox"/> Monthly reports <li data-bbox="236 1564 502 1596"><input type="checkbox"/> Quarterly reports <li data-bbox="236 1596 502 1628"><input type="checkbox"/> Annual reports <li data-bbox="236 1628 502 1660"><input type="checkbox"/> Report assignments <li data-bbox="236 1660 502 1691"><input type="checkbox"/> Filing system 	
Walk through of area of responsibility	

Day 2: The focus of the morning is on becoming familiar with the organization's manuals, e.g., where they are, which are available and what's in them so the ICP will know where to go for the specific type of information. Part of the time should be spent identifying guidelines: where they are and what is in them. The role of the ICP as a consultant should be discussed with the mentor including the methods by which IPAC get consulted, and documentation of involvement when consulted by the patient care units. Part of the time will be used to tour specific areas of the facility to identify where they are and to be introduced to key individuals. In the afternoon time is allocated for reviewing committees and key resources. The ICP should be introduced to the types of committees that IPAC is involved with, their mandate and the ICP's roles on the committee, as well as where to find minutes/reports, the schedules of meetings and the participants of the committees. Additionally the mentor will identify key national and provincial websites for IPAC guidelines and information.

Activity	Comments
Morning	
Manuals <ul style="list-style-type: none"> <input type="checkbox"/> Orientation Manual <input type="checkbox"/> Infection Control Policy and Procedure Manual <input type="checkbox"/> Policy and procedure development responsibilities <input type="checkbox"/> ARO policy <ul style="list-style-type: none"> <input type="checkbox"/> Management of AROs – MRSA, VRE, ESBLs <input type="checkbox"/> Flagging in meditech <input type="checkbox"/> Management of <i>Clostridium difficile</i> <input type="checkbox"/> Pandemic Guidelines <input type="checkbox"/> Influenza guidelines 	
Consultation <ul style="list-style-type: none"> <input type="checkbox"/> Responsibilities <input type="checkbox"/> Communication <ul style="list-style-type: none"> <input type="checkbox"/> Email <input type="checkbox"/> Response times <input type="checkbox"/> General communication tips <input type="checkbox"/> Documentation 	
<input type="checkbox"/> Brief tour of specific areas such as <ul style="list-style-type: none"> <input type="checkbox"/> OR <input type="checkbox"/> MPD (in-depth tour later) <input type="checkbox"/> Laundry <input type="checkbox"/> Pharmacy <input type="checkbox"/> Diagnostic Imaging <input type="checkbox"/> Laboratory (in-depth tour later) <input type="checkbox"/> Other (to be identified with mentor) 	
Afternoon	
Committees <ul style="list-style-type: none"> <input type="checkbox"/> Committee responsibilities <input type="checkbox"/> Regional committees <input type="checkbox"/> Regional Infection Control Committee <input type="checkbox"/> Infection Control Committee <input type="checkbox"/> IPAC monthly meetings/responsibilities <input type="checkbox"/> Other relevant committees 	

Activity	Comments
Guidelines and web links	
<p>National/International</p> <ul style="list-style-type: none"> <input type="checkbox"/> PHAC Guidelines http://www.phac-aspc.gc.ca/dpg-eng.php <input type="checkbox"/> CDC http://www.cdc.gov/hai/ <input type="checkbox"/> CHICA-Canada http://www.chica.org/index.php <input type="checkbox"/> CHICA-Canada evidence based guidelines http://www.chica.org/links_evidence_guidelines.php <input type="checkbox"/> CHICA-Canada Association/Organizations http://www.chica.org/links_orgs.php <input type="checkbox"/> American Practitioner in Infection Control http://www.apic.org/ <input type="checkbox"/> APIC Elimination Guides http://www.apic.org/Practice-Guidance/elimination-guides <input type="checkbox"/> Accreditation Canada http://www.accreditation.ca/ <p>PIDAC Knowledge Products (Ontario Best Practices) http://www.oahpp.ca/resources/pidac-knowledge/index.html</p> <p>Provincial</p> <ul style="list-style-type: none"> <input type="checkbox"/> PIC-NL Group <ul style="list-style-type: none"> o Infection Prevention and Control http://www.health.gov.nl.ca/health/publichealth/cdc/infectionpreventionandcontrol.html o Infection Control Guidelines http://www.health.gov.nl.ca/health/publichealth/cdc/infectionpreventionandcontrol.html#infection <p>Such as:</p> <ul style="list-style-type: none"> o Routine Practices and Additional Precautions o List of infectious diseases/precautions 	
<ul style="list-style-type: none"> <input type="checkbox"/> Journals/Text <ul style="list-style-type: none"> o APIC http://www.ajicjournal.org/ o CJIC http://www.chica.org/inside_cjic_journal.php <input type="checkbox"/> APIC Text http://text.apic.org/ <input type="checkbox"/> Canadian Fundamentals of Nursing by Perry & Potter 	

Day 3: The focus of the morning is working with the mentor to understand the daily ICP routine, such as reviewing reports and planning daily activities, and following the mentor as she/he participates in scheduled activities. The afternoon is used to start working on the Surveillance Module, sections 1 and 2 (readings, exercises and discussion with the mentor).

Activity	Comments
Morning (practice)	
<input type="checkbox"/> Review daily responsibilities	
<input type="checkbox"/> Work with mentor	
<input type="checkbox"/> Review daily reports	
Afternoon (theory)	
Surveillance Module : Sections 1 and 2	
<input type="checkbox"/> Key concepts for surveillance	
<input type="checkbox"/> Types of surveillance	
<input type="checkbox"/> Definitions of nosocomial infections	
Day 4: In the morning the ICP will work with the mentor on IPAC surveillance projects. The mentor will provide an overview of the surveillance requirements for the organization and the surveillance projects assigned to the new ICP. Included will be an overview of how to identify sources of the data, including medical records' access from the computer, patients' charts on patient care units, microbiology reports, and admission records. In the afternoon work can continue on the Surveillance Module, sections 3, 4 and 5.	
Activity	Comments
Morning (practice)	
<input type="checkbox"/> Surveillance activities for IPAC program	
<input type="checkbox"/> Surveillance in specific areas <ul style="list-style-type: none"> o Support departments o High risk areas o Infection control reports (if applicable) o Definitions for nosocomial infections o Classification of surgical wound infections 	
<input type="checkbox"/> May include: <ul style="list-style-type: none"> o AROs o Influenza like illness o Surgical site infections o <i>Clostridium difficile</i> o Bloodstream infections o Central line infections o Ventilator associated pneumonia o Urinary tract infections o Any others? 	
<input type="checkbox"/> Type – hospital wide or targeted	
<input type="checkbox"/> Determine surveillance assignments <ul style="list-style-type: none"> o Review assignment 	
<input type="checkbox"/> Identify sources of data <ul style="list-style-type: none"> o Nursing rounds o Admission forms o Laboratory reports 	

Activity	Comments
<input type="checkbox"/> Sources of data continued <ul style="list-style-type: none"> <input type="checkbox"/> Patient Records on computer <input type="checkbox"/> Patient Charts for inpatients 	
<input type="checkbox"/> Medical Records <ul style="list-style-type: none"> <input type="checkbox"/> Accessing patient records <input type="checkbox"/> Permissions/privacy policy <input type="checkbox"/> Tour of Medical Records (if applicable) <input type="checkbox"/> Key contacts in Medical Records <input type="checkbox"/> Flagging of patient's charts 	
Afternoon (theory)	
Surveillance Module: Sections 3, 4, and 5 <ul style="list-style-type: none"> <input type="checkbox"/> Collection, evaluation and interpretation of data <ul style="list-style-type: none"> <input type="checkbox"/> Prevalence and incidence <input type="checkbox"/> Numerators and denominators <input type="checkbox"/> Presentation of data (graph, histogram) <input type="checkbox"/> Reporting of data <input type="checkbox"/> Basic principles of epidemiology <input type="checkbox"/> Infection versus colonization 	
Day 5: In the morning the mentor will provide the orientee with an orientation to the practice area and introduce the ICP to key staff. It will also be an opportunity to identify patients on Additional Precaution and to mentor the ICP regarding the activities relating to these precautions, such as ensuring that the isolation is appropriate and in place, that adequate PPE is available, ABHR is near the point of care, and how questions from the staff regarding the precautions are answered. In the afternoon the Routine Practices and Additional Precautions (RPAP) module can be started focusing on sections 1 and 2.	
Activity	Comments
Morning (practice)	
<ul style="list-style-type: none"> <input type="checkbox"/> Orientation to unit/areas of responsibility <input type="checkbox"/> Meet with key contacts <ul style="list-style-type: none"> <input type="checkbox"/> Managers, Patient Care Coordinators, Staff <input type="checkbox"/> Identify patients on Contact, Droplet or Airborne Precautions <input type="checkbox"/> Determine high risk areas <input type="checkbox"/> Point out focus areas for IPAC <ul style="list-style-type: none"> <input type="checkbox"/> Attention to PPE <input type="checkbox"/> Hand hygiene practices <input type="checkbox"/> Signage for Additional Precautions 	
Afternoon (theory)	
RPAP Module: Sections 1 and 2 <ul style="list-style-type: none"> <input type="checkbox"/> Chain of Infection <input type="checkbox"/> Modes of transmission <input type="checkbox"/> Point of Care Risk Assessment (PCRA) <input type="checkbox"/> Hand Hygiene <input type="checkbox"/> Personal Protective Equipment (PPE) 	

Activity	Comments
<ul style="list-style-type: none"><input type="checkbox"/> Environmental Controls<ul style="list-style-type: none"><input type="checkbox"/> Patient placement<input type="checkbox"/> Negative pressure rooms<input type="checkbox"/> Cleaning of equipment<input type="checkbox"/> Environmental cleaning<input type="checkbox"/> Sharps safety<input type="checkbox"/> Management of laundry, dishes, & waste<input type="checkbox"/> Source Controls<ul style="list-style-type: none"><input type="checkbox"/> Patient flow<input type="checkbox"/> Respiratory hygiene<input type="checkbox"/> AGMPs<input type="checkbox"/> Visitor management<input type="checkbox"/> Aseptic technique<input type="checkbox"/> Additional Precautions<ul style="list-style-type: none"><input type="checkbox"/> Airborne<input type="checkbox"/> Contact<input type="checkbox"/> Droplet	

Week 2

Day 1: The activities of the week must be planned with attention to any tours that must be arranged, such as with the laboratory or materials reprocessing department (MPD). The mentor must plan the tours giving advance notice to the manager of the department and giving them a copy of the module relating to the tour. This will allow the manager time to appoint a staff member who will facilitate the ICP's tour of the department. In this week the mentor will introduce the educational responsibilities of the ICP and coordinate opportunities for the ICP to attend education seminars provided by other ICPs (if possible). The focus of the morning should be first to review the activities of the last week. Does the ICP have specific questions about a specific practice or area? How did the ICP do with the readings? Also in the morning, the ICP can do some routine work in the area of responsibility. In the afternoon the ICP will begin work on the Microbiology Module sections 1 and 2; work will continue on the RPAP Module later in the week.

Activity	Comments
Morning (practice)	
<input type="checkbox"/> Discuss with mentor weekly activities and daily assignments <input type="checkbox"/> Designate times and make arrangements for tours of specific areas for week 3 such as <ul style="list-style-type: none"> ○ Laboratory – 3 hours ○ MPD – 2 hours <input type="checkbox"/> Review daily reports <input type="checkbox"/> Collaborate with mentor on performing responsibilities in assigned area <input type="checkbox"/> Discuss in-service education responsibilities <input type="checkbox"/> Observe an education session if available this week	
Afternoon (theory)	
Microbiology Module: Sections 1 and 2 <ul style="list-style-type: none"> ○ Basic microbiology/practice microbiology ○ Review routine microbiology lab requisitions ○ Diagnostic methods/collection of specimens ○ Interpretation of culture and sensitivity reports 	
Day 2: After a morning discussion on the activities for the day the ICP will now start with a review of daily admission reports, microbiology reports or reports from any patient care areas. The ICP may visit the practice area and review any patients on isolation precautions. In the afternoon the RPAP Module will be completed.	
Morning (practice work)	
<input type="checkbox"/> Discuss with mentor daily activities <input type="checkbox"/> Review daily reports <input type="checkbox"/> Assigned area responsibilities <input type="checkbox"/> Assess RPAP as you walk through patient areas <input type="checkbox"/> Review microbiology reports	

Activity	Comments
Afternoon (theory)	
RPAP Module: Sections 3, 4 and 5	
<p>Day 3: In the morning the mentor can discuss hand hygiene with the ICP, including the program used by the facility, the educational endeavours to highlight hand hygiene, the use of ABHR, and the availability of hand hygiene sinks; the process for hand hygiene audits should also be reviewed. In the afternoon the ICP will be ready to start the Hand Hygiene module sections 1 and 2.</p>	
Morning (practice)	
<input type="checkbox"/> Discuss with mentor daily activities <input type="checkbox"/> Review daily reports <input type="checkbox"/> Assigned area responsibilities <input type="checkbox"/> Assess RPAP while walking through patient areas <input type="checkbox"/> Observe hand hygiene practices	
Afternoon (theory)	
Hand Hygiene Module: Sections 1 and 2	
<p>Day 4: In the morning the ICP will continue to learn the daily routine expectations for the job. On the tour of the unit the practices relating to RPAP and hand hygiene will be reviewed. In the afternoon the Microbiology Module sections 3, 4 and 5 will be completed.</p>	
Morning (practice)	
<input type="checkbox"/> Discuss with mentor daily activities <input type="checkbox"/> Review daily reports <input type="checkbox"/> Assigned area responsibilities <input type="checkbox"/> Assess RPAP while walking through patient areas <input type="checkbox"/> Observe hand hygiene practices	
Afternoon (theory)	
Microbiology Module: Sections 3, 4, and 5	
<p>Day 5: The ICP may start the work day doing routine surveillance and the routine activities of ICP life. In the afternoon the Hand Hygiene module can be completed. A time should be allotted with the mentor to discuss the progress of the past two weeks, to determine if the pace is acceptable to both and to plan or revise plans for the rest of the orientation</p>	
Morning (practice)	
<input type="checkbox"/> Discuss with mentor daily activities <input type="checkbox"/> Review daily reports <input type="checkbox"/> Assigned area responsibilities <input type="checkbox"/> Assess RPAP as you walk through patient areas <input type="checkbox"/> Observe hand hygiene practices	
Afternoon (theory)	
Hand Hygiene Module: Sections 3, 4 and 5	

Week 3

Day 1: In the morning the activities for the week can be reviewed and adjusted to accommodate the mentor and ICP. A review of how the ICP is doing with the modules can be done and the mentor can advise as to how to focus on certain modules/sections and agree to leave other sections for later. The ICP may do the routine work as required by the program responsibilities in the morning. In the afternoon the Cleaning, Disinfection and Sterilization Module sections 1 and 2 can be started.

Activity	Comments
Morning (practice)	
<input type="checkbox"/> Discuss with mentor weekly activities <input type="checkbox"/> Plan for tour of laboratory and MPD if applicable <input type="checkbox"/> Review daily activities for assigned areas	
Afternoon (theory)	
Cleaning, Disinfection & Sterilization Module: Sections 1 and 2 <input type="checkbox"/> Principles of cleaning/disinfection/sterilization <input type="checkbox"/> Non-critical, semi-critical and critical devices <input type="checkbox"/> Single-use devices <input type="checkbox"/> Selection of disinfectants <input type="checkbox"/> Reprocessing of re-usable devices	
Day 2: In the morning the focus is on the routine activities of an ICP. The mentor and ICP should plan on having the afternoon devoted to educational activities. This may include reviewing the educational programs offered by IPAC, developing a PowerPoint presentation on an IPAC topic, getting a tour of the seminar room and available AV equipment, and getting the contact information for setting up an educational event. This is also a time for the ICP to discuss his/her own personal learning plan. Will there be an opportunity to participate in a novice ICP course? Will the Certification in Infection Control be a priority? Is there a need for specific courses relating to the computer or databases such as Word or Access or Excel?	
Activity	Comments
Morning (Practice)	
<input type="checkbox"/> Review daily activities for assigned areas <input type="checkbox"/> Surveillance activities for assigned program <input type="checkbox"/> Walk through of assigned area <input type="checkbox"/> Review isolated patients if applicable <input type="checkbox"/> Review practices related to an isolation room activities <input type="checkbox"/> Observation of RPAP practices and hand hygiene practices	
Afternoon (theory)	
Education <input type="checkbox"/> Discuss educational responsibilities <input type="checkbox"/> Review orientation program for new staff and other education program regularly provided by IPAC	

Activity	Comments
<input type="checkbox"/> If possible plan to attend an education session this week <input type="checkbox"/> Develop a PowerPoint presentation on a IPAC topic <input type="checkbox"/> Adult learning principles <input type="checkbox"/> Preparing and giving presentation <input type="checkbox"/> Booking rooms / equipment, posting notices <input type="checkbox"/> Education materials <input type="checkbox"/> Orientation, formal/information education sessions <input type="checkbox"/> Our role in general/nursing orientation <input type="checkbox"/> Research activities	
Personal Learning Plan: Discuss with manager <ul style="list-style-type: none"> ○ ARNNL requirements ○ ICP ○ CIC ○ Infection Control basic course ○ CHICA-NL education sessions ○ Webber training ○ CHICA – NL 	
Day 3: If this is the morning for the organized laboratory orientation the ICP will meet in the lab with the facilitator. A copy of the Microbiology Module should be available to guide the visit and the ICP should review the contents of the tour section prior to the visit. In the afternoon the Outbreak Module sections 1 and 2 will be started.	
Activity	Comments
Morning (practice)	
Organized lab orientation	
<input type="checkbox"/> Bring Microbiology Module to lab and discuss with lab facilitator <input type="checkbox"/> Identify key contacts in lab	
Afternoon (theory)	
Outbreak Module: Sections 1 and 2	
<input type="checkbox"/> Definition of an outbreak <input type="checkbox"/> Components of outbreak investigation <input type="checkbox"/> Outbreak management	
Day 4: The ICP should now feel comfortable in completing the routine activities relating to IPAC responsibilities. In the afternoon the Cleaning, Disinfection and Sterilization Module will be continued.	
Morning (practice)	
<input type="checkbox"/> Review daily activities for assigned areas <input type="checkbox"/> Surveillance activities for assigned program <input type="checkbox"/> Walk through of assigned area <input type="checkbox"/> Review isolated patients if applicable	
Afternoon (theory)	
Cleaning, Disinfection & Sterilization Module: Sections 3, 4, and 5	

Day 5: In the morning the focus will be on the routine activities of an ICP. In the afternoon the mentor and ICP should review the progress to date and identify high priority items for the last week of orientation.

Activity	Comments
Morning (practice)	
<input type="checkbox"/> Review daily activities for assigned areas <input type="checkbox"/> Surveillance activities for assigned program <input type="checkbox"/> Walk through of assigned area <input type="checkbox"/> Review isolated patients if applicable	
Afternoon (Mentor session)	
<input type="checkbox"/> Complete any reports/assignments <input type="checkbox"/> Review orientation program <input type="checkbox"/> Identify any skills/education required	

Week 4

Day 1: During this week the mentor should arrange for the ICP to meet with i) the Communicable Disease Control Nurse (CDCN) or Public Health professional responsible for the notifiable disease surveillance and reporting, and ii) Occupational Health Nurse or Occupational Health & Safety professional. This will introduce the ICP to the overlapping responsibilities within these two areas. In the morning the mentor and ICP will discuss priority topics for the week and review the notifiable disease list and reporting responsibilities.

Activity	Comments
Morning	
<input type="checkbox"/> Discuss with mentor weekly activities	
<input type="checkbox"/> Plan for tour of MPD if applicable	
<input type="checkbox"/> Plan for education session	
<input type="checkbox"/> Review daily activities for assigned areas	
Afternoon	

Communicable Disease Module

- A one hour meeting with a CDCN is recommended to supplement this activity
- Communicable disease reporting
- List of infectious diseases/precautions
- Notifiable Disease List
- MOH/CDCNs

Day 2: In the morning the ICP can work in the assigned program. In the afternoon the Outbreak Module sections 3, 4 and 5 can be done.

Activity	Comments
Morning	
<input type="checkbox"/> Review daily activities for assigned areas	
<input type="checkbox"/> Surveillance activities for assigned program	
<input type="checkbox"/> Walk through of assigned area	
<input type="checkbox"/> Review isolated patients if applicable	
Afternoon	
Outbreak Module: Sections 3, 4, and 5	

Day 3: In the morning the tour of MPD with a facilitator will be the highlight. It is recommended that the Cleaning, Disinfection and Sterilization Module be completed prior to this tour and that the facilitator for the tour has a copy of the module. This will help the facilitator focus on the topics that must be addressed during the tour. The afternoon will focus on the role of the ICP within Occupational Health and Safety. It is recommended that a meeting with a representative of this division be included in the learning experience.

Activity	Comments
Morning	
<input type="checkbox"/> Tour of MPD (if applicable)Plan 2 hours	
<input type="checkbox"/> Review daily activities for assigned areas	
Afternoon	
Occupational Health Module	
<input type="checkbox"/> Meeting with Occupational Health & Safety staff	

Day 4: In the morning the ICP can function in the area of responsibility. The afternoon will provide an opportunity to review the role of the ICP in the area of Quality Improvement (QI) and Risk Management. The mentor can either provide this information or explore the possibility of having the orientation to this aspect of IPAC done by a QI staff.

Activity	Comments
Morning	
<input type="checkbox"/> Review daily activities for assigned areas <input type="checkbox"/> Surveillance activities for assigned program <input type="checkbox"/> Walk through of assigned area <input type="checkbox"/> Review isolated patients if applicable	
Afternoon	
Role of IPAC in Quality and Risk Management <input type="checkbox"/> Accreditation Canada <input type="checkbox"/> New IC standards ROPs, road maps, plans, etc <input type="checkbox"/> CCHSA patient safety goals and required practices <input type="checkbox"/> Quality and practice safety leaders <input type="checkbox"/> Quality council, Quality improvement teams <input type="checkbox"/> Performance Improvement Teams (if applicable) <input type="checkbox"/> Quality indicators, infection control audits <input type="checkbox"/> Incident/occurrence reporting <input type="checkbox"/> Canadian Patient Safety Institute (CPSI) http://www.patientsafetyinstitute.ca/English/Pages/default.aspx <input type="checkbox"/> Safer Healthcare Now! Interventions http://www.saferhealthcarenow.ca/EN/Interventions /SafeSurgery/Pages/default.aspx <input type="checkbox"/> IPAC <input type="checkbox"/> CLABSI <input type="checkbox"/> VAP <input type="checkbox"/> SSI <input type="checkbox"/> Safe surgery saves lives <input type="checkbox"/> Antibiotic Utilization <input type="checkbox"/> Product evaluation/tender process	
Day 5: In the morning the ICP and mentor should review the orientation program in detail and develop a plan for completion of items not covered during the past four weeks. The evaluation should be provided to the orientee. In the afternoon the ICP can either start the Construction/Renovation Module or complete another module that has been started.	
Morning	
<input type="checkbox"/> Meet with mentor <input type="checkbox"/> Discuss orientation process <input type="checkbox"/> Daily ICP activities	
Afternoon	
Construction/Renovation Module (if applicable)	

Surveillance Module

Objectives

At the completion of a 4-6 week orientation period the ICP will:

1. Describe a surveillance program within the Infection Control Program of your facility and assess its strengths and limitations in terms of:
 - Purpose and objectives
 - Type of surveillance used
 - Date sources for identifying cases
 - Definition used to confirm cases
 - Data collection methods and forms
 - Data analysis method
 - Summary of the findings including conclusions, recommendations and follow-up
2. Collect, manage, analyze, interpret and report data from a surveillance program

Number of hours

- Readings – 4 hours
- Activities – 10 hours

Required reading

APIC Text: chapter 3 or Bennett and Brachman: chapter 6

- CDC/NHSN Surveillance definition of health care-associated infection and criteria for specific types of infections in the acute care setting.
<http://www.cdc.gov/ncidod/dhqp/pdf/nnis/NosInfDefinitions.pdf>
- PowerPoint presentations on CHICA website from 2007 conference
http://www.chica.org/Members/conf_presentations07.html
 - Surveillance half day session given by Drs. D. Moralejo and E. Henderson
 - Focus Your Surveillance
 - Maximizing Data Collection
 - Surveillance – Data Handling
 - Interpreting and Reporting Surveillance Results
- Ontario's Best Practices for Surveillance of Health Care-Associated Infections in Patient and Resident Populations available on line at:
http://www.health.gov.on.ca/english/providers/program/infectious/diseases/best_prac/bp_hai.pdf

Instructions

Read the material, view the PowerPoint presentations, talk to your colleagues, and do the practice exercises. Write out your answers to the questions and discuss them with your mentor.

I. Overview

We spend a lot of time doing surveillance. It's important to be able to identify where problems are so we can focus interventions to improve patient outcomes. Each surveillance program, e.g., SSI, VAP, MRSA, should have a clear purpose and specific objectives. This helps focus data collection and analysis and also helps sell the program to administrators! Complete the following exercise so you know your facility's surveillance programs. Choose one for use in later exercises in this module. This will help you apply concepts to a program and help you understand one of your programs better. It would not be possible to do an in-depth review of all of your programs during the orientation period.

Your Surveillance Programs	
Program	Purpose and specific objectives
Choose one for further review in this module:	

II. Key Concepts

Key concepts refer to the basic information that an ICP will require in order to do surveillance effectively. From the readings, complete each of the following tables. Doing so will help you take notes of important definitions, facts and comparisons.

i. Definition, purpose & objectives of surveillance

Define surveillance:
List 5 purposes of surveillance: 1. 2. 3. 4. 5.

Review the list of your surveillance programs that you wrote in section I. Now that you know more about purpose and objectives, revise the purpose and objectives, as necessary, of each of the programs you listed.

ii. Define each of the following terms

You will encounter these in the context of both surveillance and outbreaks.

Epidemiology	
Population	
Case	
Case definition	
Numerator	
Denominator	
Rate	
Attack rate	
Endemic	
Cluster	
Epidemic	
Pandemic	
Prevalence	
Incidence	
Incidence density	
Distribution	
Proportion	
Baseline	

Surgical site infections surveillance terms	
Wound classification	
Risk index	
ASA score	

iii. Types of surveillance

There are many different types of surveillance approaches, each of which has strengths and limitations. It is important to decide which approach will best suit your surveillance program's purpose and objectives.

	Total Surveillance	Targeted Surveillance
Definition		
Strengths		
Limitations		
Examples		

	Syndromic	Sentinel
Definition		
Strengths		
Limitations		
Examples		

	Process	Outcome
Definition		
Strengths		
Limitations		
Examples		

	Retrospective	Prospective
Definition		
Strengths		
Limitations		
Examples		

iv. Your surveillance program

Review Your Surveillance Program: Purpose, Objectives, Approach	
<i>Instructions:</i> Assess the program you have chosen in terms of the following:	
Identify its purpose and objectives	
Describe the approaches: e.g., is the program targeted or total surveillance, syndromic or sentinel, process or outcome, retrospective or prospective?	
Are the approaches appropriate for the purpose and objectives? If not, what should be changed and why?	

III. Methods

In this section you will focus on the steps that need to be followed in order to identify, collect, handle and analyze the data.

i. Definition of cases

Consistent criteria must be used to define cases in order to accurately collect the data and be able to compare the results of different surveillance programs. National organizations have identified case definitions for surgical site infections, urinary tract infections and other healthcare-associated infections. For example, the CDC's healthcare-associated surveillance definitions are widely used in North America. They are available at <http://www.cdc.gov/hcicod/dhqp/pdf/nnis/NosInfDefinitions.pdf>.

Other examples of definitions are provided in Appendix A.

Review Your Surveillance Program: Definitions	
<i>Instructions:</i> Assess the program you have chosen in terms of the following:	Identify the definition(s) of infection used in the program and the source(s) for the definition(s) used.
Are the definitions clear and concise?	
Are the definitions standard? How comparable are the results of your surveillance program to others in terms of the definitions used?	

ii. Sources of cases

There are a number of sources that will be utilized to identify cases and may include: admission forms, nurses on the patient care units, microbiology lab, ICP ward rounds, antibiotic use, physicians and community health practitioners. Complete the following table to help you summarize the strengths and limitations of the different options.

Source of information	Strengths	Limitations
Admission forms		
Chart review (retrospective)		
Chart review on unit		
ICP ward rounds		
Microbiology lab reports		
Antibiotic use reports		
Reports from nurses		
Reports from doctors (e.g. post discharge)		
Other		

Review Your Surveillance Program: Sources of Data	
<i>Instructions:</i> Identify the sources of data for identifying infections used in the surveillance program you have chosen. Can you identify additional strengths or limitations?	
Explain why you need multiple sources for identifying possible infections.	
Discuss sources for denominator data, and their strengths and limitations.	

iii. Data collection

Describe how you collect data to confirm a case or reject it as a case: what data do you collect and why, and how do you collect it (e.g., form to use, accessing meditech results). It may be necessary to collect information from multiple sources such as pharmacy, chart review, x-ray data, and laboratory data therefore usually a form is required so that the same information is collected on all cases. For efficiency and ethical reasons, you should only collect the data that you need. Data collection procedures should include strategies for ensuring accuracy and completeness of data.

Describe the methods used for obtaining denominator data.	
Review Your Surveillance Program: Data Collection	
<i>Instructions:</i> Describe the program you have chosen in terms of the following:	
Identify the methods used for collecting data to confirm or reject cases.	
Describe strategies to ensure you are collecting quality data.	

Review Your Surveillance program: Practice with Data Collection
<p>Instructions: For the program you have chosen, collect some data, e.g., do a chart review using the form and definition; collect the information from pharmacy etc. Answer the following questions:</p> <p>Assess what worked and didn't work well in terms of identifying infections e.g., issues with applying the definition, finding the information. How could data collection be improved?</p>
<p>Assess what worked and didn't work well in terms of identifying the denominator. How could this be improved?</p>

iv. Data handling

How you manage your data can affect both the efficiency and effectiveness of your surveillance program. A computerized system is essential, but there are many options available. Rather than be familiar with the variety of potential options, you need to understand the one used in your facility, even if you are not the person to enter data.

Review Your Surveillance program: Data Handling
<p>Instructions: For the program you have chosen, answer the following questions:</p> <p>Describe the system used for data management:</p> <ol style="list-style-type: none">1. What database is used?2. Who enters the data?3. Who is responsible for maintaining the system?
<p>What strategies are used to ensure data entry is accurate and complete, and data is "clean"?</p>

Review Your Surveillance program: Practice Data Handling
<p><i>Instructions:</i> Practice entering data from at least 3 data collection forms, and answer the following questions:</p>
Assess what worked and didn't work well in terms of data entry. How could data entry be improved?

v. Data analysis

Surveillance data is used to generate infection rates, which can then be interpreted to identify if there is a problem to be addressed or if interventions have been effective.

Review Your Surveillance Program: Practice with Data Analysis
For the program you have chosen: Calculate and interpret the following rates (as appropriate for the data). Interpretation could be: rates are high, low, changed, "good", "bad" etc. <ul style="list-style-type: none">▪ Incidence rate▪ Prevalence rate
Generate graphs to display the data over time or by groups of interest, and interpret the trends
Discuss sources for benchmark or comparison data (e.g., NNIS, your own, research study results, literature) with strengths and limitations (e.g., definitions used, completeness of data, availability, comparability of populations. Defend the choice of comparison data.
Interpret the rates using appropriate benchmark or comparison.

IV. Documentation and Reporting

Collecting data is a waste of time if the results are not used to promote quality practice. Reports are a key strategy for sharing results and relevant recommendations.

Discuss the purpose and value of writing reports. Who should get the report and information do they need, at what frequency?

Describe the parts of a report.

Discuss the role of the ICP in following up recommendations.

Review Your Surveillance Program: Reports

Instructions: For the program you have chosen, review a previously written report and answer the following questions:

Assess the written report in terms of its readability, completeness and clarity.

Determine what actions were taken as a result of the report to improve patient outcomes, or surveillance, as a result of the report.

What recommendations would you make for improving the report or follow-up?

V. Other Issues: Ethics

Discuss ethical issues relating to surveillance in terms of why they are issues and how they can be addressed.

- Confidentiality
- Privacy
- Mandatory reporting

Conclusion

This concludes the review of surveillance. You should now feel more comfortable with both the key concepts and methods associated with surveillance. If you identified recommendations for strengthening the surveillance program you reviewed, discuss with your mentor how they might be implemented. As you get more comfortable with surveillance, apply the same critical appraisal to the other surveillance programs to evaluate or redevelop them and consider these key points if you develop new surveillance programs.

Appendix A - Definitions

Surgical site infections

CRITERIA FOR DEFINING A SURGICAL SITE INFECTION (SSI)*

Superficial Incisional SSI

Infection occurs within 30 days after the operation

and

infection involves only skin or subcutaneous tissue of the incision

and at least *one* of the following:

1. Purulent drainage, with or without laboratory confirmation, from the superficial incision.
2. Organisms isolated from an aseptically obtained culture of fluid or tissue from the superficial incision.
3. At least one of the following signs or symptoms of infection: pain or tenderness, localized swelling, redness, or heat *and* superficial incision is deliberately opened by surgeon, *unless* incision is culture-negative.
4. Diagnosis of superficial incisional SSI by the surgeon or attending physician.

Do *not* report the following conditions as SSI:

1. Stitch abscess (minimal inflammation and discharge confined to the points of suture penetration).
2. Infection of an episiotomy or newborn circumcision site.
3. Infected burn wound.
4. Incisional SSI that extends into the fascial and muscle layers (see deep incisional SSI).

Note: Specific criteria are used for identifying infected episiotomy and circumcision sites and burn wounds.⁴³³

Deep Incisional SSI

Infection occurs within 30 days after the operation if no implant[†] is left in place or within 1 year if implant is in place and the infection appears to be related to the operation

and

infection involves deep soft tissues (e.g., fascial and muscle layers) of the incision

and at least *one* of the following:

1. Purulent drainage from the deep incision but not from the organ/space component of the surgical site.
2. A deep incision spontaneously dehisces or is deliberately opened by a surgeon when the patient has at least one of the following signs or symptoms: fever (>38°C), localized pain, or tenderness, unless site is culture-negative.
3. An abscess or other evidence of infection involving the deep incision is found on direct examination, during reoperation, or by histopathologic or radiologic examination.
4. Diagnosis of a deep incisional SSI by a surgeon or attending physician.

Notes:

1. Report infection that involves both superficial and deep incision sites as deep incisional SSI.
2. Report an organ/space SSI that drains through the incision as a deep incisional SSI.

Organ/Space SSI

Infection occurs within 30 days after the operation if no implant[†] is left in place or within 1 year if implant is in place and the infection appears to be related to the operation

and

infection involves any part of the anatomy (e.g., organs or spaces), other than the incision, which was opened or manipulated during an operation *and* at least *one* of the following:

1. Purulent drainage from a drain that is placed through a stab wound[‡] into the organ/space.
2. Organisms isolated from an aseptically obtained culture of fluid or tissue in the organ/space.
3. An abscess or other evidence of infection involving the organ/space that is found on direct examination, during reoperation, or by histopathologic or radiologic examination.
4. Diagnosis of an organ/space SSI by a surgeon or attending physician.

* Horan TC et al.²²

† National Nosocomial Infection Surveillance definition: a nonhuman-derived implantable foreign body (e.g., prosthetic heart valve, nonhuman vascular graft, mechanical heart, or hip prosthesis) that is permanently placed in a patient during surgery.

‡ If the area around a stab wound becomes infected, it is not an SSI. It is considered a skin or soft tissue infection, depending on its depth.

Source: Mangram AJ, Horan TC, Pearson ML, Silver LC, Jarvis WR and the Hospital Infection Control Practices Advisory Committee. (1999). Guideline for Prevention of Surgical Site Infection, 1999. *Infect Control Hosp Epidemiol* 1999; 20(4): 247-277.

Urinary Tract Infections

CDC Definitions of Nosocomial Infections A-3

Definitions of Infection Sites

INFECTION SITE: Symptomatic urinary tract infection

CODE: UTI-SUTI

DEFINITION: A symptomatic urinary tract infection must meet at least one of the following criteria:

Criterion 1: Patient has at least *one* of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}$ C), urgency, frequency, dysuria, or suprapubic tenderness
and
 patient has a positive urine culture, that is, $\geq 10^5$ microorganisms per cm^3 or urine with no more than two species of microorganisms.

Criterion 2: Patient has at least *two* of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}$ C), urgency, frequency, dysuria, or suprapubic tenderness
and
 at least *one* of the following:
 a. positive dipstick for leukocyte esterase and/or nitrate
 b. pyuria (urine specimen with ≥ 10 wbc/mm^3 or ≥ 3 $\text{wbc}/\text{high power field of unspun urine}$)
 c. organisms seen on gram stain of unspun urine
 d. at least *two* urine cultures with repeated isolation of the same uropathogen (gram-negative bacteria or *S. saprophyticus*) with $\geq 10^2$ colonies/ml in nonvoided specimens

e. $\leq 10^5$ colonies/ml of a single uropathogen (gram-negative bacteria or *S. saprophyticus*) in a patient being treated with an effective antimicrobial agent for a urinary tract infection
 f. physician diagnosis of a urinary tract infection
 g. physician institutes appropriate therapy for a urinary tract infection.

Criterion 3: Patient ≤ 1 year of age has at least *one* of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}$ C), hypothermia ($<37^{\circ}$ C), apnea, bradycardia, dysuria, lethargy, or vomiting
and
 patient has a positive urine culture, that is, $\geq 10^5$ microorganisms per cm^3 of urine with no more than two species of microorganisms.

Criterion 4: Patient ≤ 1 year of age has at least *one* of the following signs or symptoms with no other recognized cause: fever ($>38^{\circ}$ C), hypothermia ($<37^{\circ}$ C), apnea, bradycardia, dysuria, lethargy, or vomiting
and
 at least *one* of the following:

- a. positive dipstick for leukocyte esterase and/or nitrate
- b. pyuria (urine specimen with ≥ 10 wbc/mm^3 or >3 $\text{wbc}/\text{high power field of unspun urine}$)
- c. organisms seen on gram stain or unspun urine
- d. at least *two* urine cultures with repeated isolation of the same uropathogen (gram-negative bacteria or *S. saprophyticus*) with $\geq 10^2$ colonies/ml in nonvoided specimens
- e. $\leq 10^5$ colonies/ml of a single uropathogen (gram-negative bacteria or *S. saprophyticus*) in a patient being treated with an effective antimicrobial agent for a urinary tract infection
- f. physician diagnosis of a urinary tract infection
- g. physician institutes appropriate therapy for a urinary tract infection.

COMMENTS:

- A positive culture of a urinary catheter tip is *not* an acceptable laboratory test to diagnose a urinary tract infection.
- Urine cultures must be obtained using appropriate technique, such as clean catch collection or catheterization.
- In infants, a urine culture should be obtained by bladder catheterization or suprapubic aspiration; a positive urine culture from a bag specimen is unreliable and should be confirmed by a specimen aseptically obtained by catheterization or suprapubic aspiration.

INFECTION SITE: Asymptomatic bacteruria

CODE: UTI-ASB

DEFINITION: An asymptomatic bacteruria must meet at least one of the following criteria:

Criterion 1: Patient has had an indwelling urinary catheter within 7 days before the culture
and
 patient has a positive urine culture, that is, $\geq 10^5$ microorganisms per cm^3 of urine with no more than two species of microorganisms
and

Source: Garner JS< Jarvis WR, Emori TG, Horan TC, Hughes JM. CDC definitions for nosocomial infections. In: Olmsted RN, ed: Apic Infection Control and Applied Epidemiology: Principles and Practice. St. Louis: Mosby: 1996: pp A1-A20

Routine Practices and Additional Precautions Module

Objectives

At the completion of a 4-6 week orientation period the ICP will:

1. Identify the key components of Routine Practices & Additional Precautions (RPAP)
2. Demonstrate an understanding of the application of RPAP in the practice areas using the case scenarios provided in terms of:
 - Considerations for point of care risk assessment
 - Indications for hand hygiene
 - Placement of patients
 - Use of personal protective equipment
 - Handling of sharps, linen, dishes, and waste
 - Information for visitors

Number of hours

- Readings – 4 hours
- Activities – 10 hours

Required readings

- Routine Practices and Additional Precautions at:
http://www.health.gov.nl.ca/health/publichealth/cdc/routine_practices_additional_precautions.pdf
- Review the education modules on Chain of Infection, Point of Care Risk Assessment, Routine Practices & Additional Precautions at:
http://www.health.gov.nl.ca/health/publichealth/h1n1/infoforpros_edu.html
- Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care – Revision of Isolation and Precautions Techniques PHAC (1999).
<http://www.collectionscanada.gc.ca/webarchives/20071124130634/http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/index.html>

Required text

- APIC Text of Infection Control & Epidemiology; 2nd or 3rd Edition
- Bennett JV & Brachman PS. Bennett & Brachman's Hospital Infections; 5th ed. Ed. William R Jarvis: Philadelphia, PA, 2007

Other readings

- Ontario Ministry of Health and Long-Term Care/Public Health Division/Provincial Infectious Diseases Advisory Committee (PIDAC)- Best Practices for Hand Hygiene in all Health Care Settings Routine Practices and Additional Precautions in all Health Care Settings (May 2010) at
<http://www.oahpp.ca/resources/pidac-knowledge/best-practice-manuals/routine-practices-and-additional-precautions.html>

- Presentations from 2007 CHICA-Canada National Education Conference –The Principles of Routine Practice available at http://www.chica.org/Members/2007conference/conf_presentations07.html

Instructions

Read the material. Write out your answers to the questions and discuss them with your mentor.

I. Overview

The guideline “Routine Practices and Additional Precautions for preventing the transmission of Infection in Healthcare” is the foundation for all infection prevention and control activities. As an ICP you will utilize this information for the development of policies and procedures, teaching of staff, and for the auditing and monitoring of practices in the practice area.

II. Key Concepts

In this section you will learn the key concepts that you must know in order to do your job as an infection prevention and control professional.

1. Principles of transmission of microorganisms

Define the following key terms:

i. Key terms

(a) *Chain of infection*

Chain of Infection	
Term	Definition
Infectious agent	
Reservoirs in health care	
Portals of exit	
Routes of transmission	
Portals of entry	
Susceptible host	

(b) Other terms

Term	Definition
Colonization	
Asymptomatic infection	
Symptomatic infection	

ii. Chain of infection application

A break in any of the links of chain of infection can prevent the transmission of infection. Using influenza as the disease provides examples of how you would break each link in the chain of infection.

Preventing transmission of influenza	
Link	Examples of breaking the chain
Infectious agent	
Reservoir	
Portal of exit	
Route of transmission	
Portal of entry	
Susceptible host	

2. Sources or reservoirs of infectious agents

Source	Example
Human	
Animal	
Environmental	

3. Routes of transmission

Route	Definition	Disease example
Contact		
Droplet		
Airborne		
Droplet/Contact		

Route	Definition	Disease example
Common vehicle		
Vectorborne		

4. Control measures

Hierarchy of Controls		
Control measure	Definition	Example
Engineering		
Administrative		
Personal protective equipment (PPE)		

5. Organizational responsibilities

Define organizational risk assessment	
Term	Give an example
Organizational engineering control responsibilities	<ul style="list-style-type: none"> • Healthcare facility design, renovation and construction • Heating, ventilation and air conditioning • Source control
Administrative control responsibilities	<ul style="list-style-type: none"> • Occupational health program • Education of healthcare workers • Reprocessing of patient care equipment • Environmental cleaning • Waste • Linen • Management of deceased patients • Management of pets/animals

6. Healthcare worker responsibilities

i. Definitions

Term	Definition
Point of Care Risk Assessment (PCRA)	
Routine Practices	
Additional Precautions	

7. History of Isolation Precautions

It is important to have an understanding of how isolation precautions have evolved over time and to know why the Public Health Agency of Canada chose to go with Routine Practices versus Standard Precautions which are promoted in the United States.

	Brief description of precautions used
Isolation wards or fever	
Category specific	
Disease specific precautions	
Universal precautions	
Body substance isolation	
Standard precautions	

8. Routine Practices

i. Point of Care Risk Assessment exercise

The ability to perform a thorough point of care risk assessment is fundamental to practicing infection control. The ICP needs to have a very complete understanding of how to do a risk assessment, how to include it in every patient interaction, and how to use the findings to implement appropriate infection control practices. The ICP will be required to educate healthcare workers (HCWs) about PCRA and reinforce its use frequently because by applying the appropriate control measures from their PCRA they are reducing risk to themselves (and indirectly their families) and the patient/resident/client.

Prior to every patient interaction, all HCWs have a responsibility to assess the infectious risk posed to themselves and other patients, visitors, and HCWs by a patient, situation or procedure.

(a) Determine factors that influence the risk of transmission of infection

Complete this Table (add 2-4 more points to each group)		
	Higher transmission risk	Lower transmission risk
Infectious Source	<ul style="list-style-type: none"> • Frequent cough • Copious secretions 	<ul style="list-style-type: none"> • Infrequent or no cough • Minimal secretions
Environment	<ul style="list-style-type: none"> • Shared room, washroom 	<ul style="list-style-type: none"> • Single room, washroom
Susceptible Host (patient)	<ul style="list-style-type: none"> • Underlying disease 	<ul style="list-style-type: none"> • Generally healthy
Susceptible Host (HCW)	<ul style="list-style-type: none"> • Inadequate hand hygiene 	<ul style="list-style-type: none"> • Diligent hand hygiene

(b) Point of care risk assessment exercise

Scenario	PCRA Questions	Infection Control Measures
	<p>Example: PCRA Questions</p> <ul style="list-style-type: none"> • Does this person have a fever • Does he practice respiratory etiquette? • What type of care am I giving him? • Where am I providing care? E.g. his home? A private room at the hospital? • What PPE should I wear when providing care? 	<p>Let's pretend that he does have a fever, resp. hygiene is not consistently used, he is in a private room and you are doing his daily nursing assessment and giving him his morning medications. In this case you would need to wear a mask with facial protection and gloves (many resp. infections are spread by both droplets and contact)</p> <p>In this section you may need to return to the IC measures when you complete RP</p>

Scenario	PCRA Questions	Infection Control Measures
		
		

ii. Source Control

Source Control for Routine Practices involves measures to separate those with symptoms of various transmissible organisms from those without symptoms. These measures can involve spatial separation whether in separating waiting rooms into 2 sections or in the separation of patients by 2 meters for respiratory illnesses involving a cough, fever or shortness of breath.

Other source control measures involve erecting partitions to protect staff and protocols to place patients with certain symptoms or known organisms or symptoms directly into a single exam room. In certain settings, appointments can be made for these patients at the end of the day, or appointments postponed until the acute phase of the illness has subsided. Other measures may include posting signs to remind patients of hand hygiene and respiratory etiquette practices and providing the supplies to perform both.

Source control measures	
Area	Source control recommendations
Emergency rooms and acute assessment settings	
Outpatient clinic	
Admitting	
Inpatient Unit	
Allied health departments	
Home care	
Physician offices	

iii. Hand Hygiene

Please refer to hand hygiene module

iv. Patient Placement and Accommodation

Single rooms have been shown to lower hospital-acquired infections. When there are only a limited number of single rooms, it is prudent to prioritize them for those who have conditions that facilitate transmission of infectious material to other persons (e.g. draining wounds, stool incontinence, and uncontained secretions) and for those who are at increased risk of acquisition and adverse outcomes resulting from health care associated infections (immunosuppression, open wounds, indwelling catheters, anticipated long stay, total dependence on HCW's for activities of daily living).

v. Patient Flow

Patient flow refers to patient transfer/transport within and outside of the facility, and patient activity.

Patient flow exercise	
Precautions required	Recommendation for transfer/transport within or outside of the facility/patient activity
Patient on Airborne Precautions	
Patient on Droplet Precautions	
Patient on Contact Precautions	

vi. Aseptic Technique**(a) Define clean and aseptic technique**

Use the following exercise to illustrate the difference between clean and aseptic technique and provide examples of procedures that require each:

	Definition	Examples
Aseptic Technique		
Clean Technique		

(b) Differentiate between clean and aseptic technique

Use the following table to show the similarities and differences between aseptic technique and clean technique:

Similarities	Differences

(c) Aseptic technique exercise

Complete the following table to provide key points for the following as they relate to aseptic technique:

	Key Points
Hand Hygiene	
Gloves	
Skin Prep	
Hair removal	
Sterile Field	
Equipment/Supplies	
Injectable Medications	

vii. Personal Protective Equipment

- Personal protective equipment (PPE) is any type of specialized clothing, barrier product, or breathing (respiratory) device used to protect workers from serious injuries or illnesses while doing their jobs.
- Personal protective equipment acts as a barrier between infectious materials and the skin, mouth, nose, or eyes (mucous membranes). In the application of Routine Practices PPE includes gloves, gowns, and face protection; masks, goggles and face shields.
- Personal protective equipment (PPE) in additional precautions includes respirators in addition to the requirements listed above.

(a) Gloves

Glove use is not a substitute for hand hygiene.

Question	Answers
Why are gloves needed?	
Who are they protecting?	
What are the indications for glove use?	
What are the key errors noted when putting on or taking off gloves?	
Demonstrate to your mentor how to put on gloves.	

(b) Gowns

Question	Answers
Why is a gown needed?	
Who is the gown protecting?	
What are the indications for gown use?	
What are the key errors noted when putting on or taking off a gown?	
Demonstrate to your colleague the proper technique for putting on a gown.	

(c) *Facial protection*

Question	Answers
List the components of facial protection	
Why is facial protection needed?	
Who is facial protection protecting?	
What are the indications for facial protection use?	
What are the key errors noted when putting on or taking off facial protection?	
Demonstrate to your colleague the proper technique for putting on facial protection.	

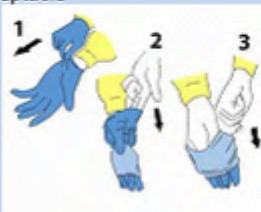
(d) Technique for putting on PPE

Number the order for putting on the PPE – number from 1 - 5

<p><input type="checkbox"/> Put on Gown</p> <ul style="list-style-type: none">▪ Tie neck and waist ties securely 	<p><input type="checkbox"/> Perform Hand Hygiene</p> 	<p><input type="checkbox"/> Put on Protective Eyewear</p> <ul style="list-style-type: none">▪ Put on eye protection and adjust to fit▪ Face shield should fit over brow 
<p><input type="checkbox"/> Put on Gloves</p> <ul style="list-style-type: none">▪ Put on gloves, taking care not to tear or puncture glove▪ If a gown is worn, the glove fits over the gown's cuff 	<p><input type="checkbox"/> Put on Mask/N95 Respirator</p> <ul style="list-style-type: none">▪ Place mask over nose and under chin▪ Secure ties, loops or straps▪ Mould metal piece to your nose bridge▪ For respirators, perform a seal-check 	

(e) Technique for taking off PPE

Number the order for taking off the PPE

<p>Remove Mask/N95 Respirator</p> <ul style="list-style-type: none"> ▪ Ties/ear loops/straps are considered to be 'clean' and may be touched with the hands ▪ The front of the mask/respirator is considered to be contaminated ▪ Untie bottom tie then top tie, or grasp straps or ear loops ▪ Pull forward off the head, bending forward to allow mask/respirator to fall away from the face ▪ Discard immediately into waste receptacle 	<p>Perform Hand Hygiene</p> 
<p>Remove Gloves</p> <ul style="list-style-type: none"> ▪ Remove gloves using a glove-to-glove/skin-to-skin technique ▪ Grasp outside edge near the wrist and peel away, rolling the glove inside-out ▪ Reach under the second glove and peel away ▪ Discard immediately into waste receptacle 	<p>Remove Gown</p> <ul style="list-style-type: none"> ▪ Remove gown in a manner that prevents contamination of clothing or skin ▪ Starting at the neck ties, the outer, 'contaminated', side of the gown is pulled forward and turned inward, rolled off the arms into a bundle, then discarded immediately in a manner that minimizes air disturbance 
<p>Remove Eye Protection</p> <ul style="list-style-type: none"> ▪ Arms of goggles and headband of face shields are considered to be 'clean' and may be touched with the hands ▪ The front of goggles/face shield is considered to be contaminated ▪ Remove eye protection by handling ear loops, sides or back only ▪ Discard into waste receptacle or into appropriate container to be sent for reprocessing ▪ Personally-owned eyewear may be cleaned by the individual after each use 	<p>Perform Hand Hygiene</p> 

viii. Sharps safety and prevention of bloodborne pathogens

Define sharps safety	
Name at least two precautions for handling of sharps	
Are there any initiatives in your facility to ensure recapping of needles is not being done?	
Are there structures in place that needles can be disposed of at the point of care in your facility?	
Does the facility policy / housekeeping policy provide direction as to when sharps containers should be removed and replaced?	
How often do the housekeeping /CSR/Maintenance staff receive education on sharps safety in your facility?	
What are the steps for staff to follow following a sharps injury?	
Review the policy on blood and body fluid exposure in your facility	

ix. Cleaning and disinfection of non-critical patient care equipment
(Refer to Cleaning, Disinfection and Sterilization Module)

x. Environmental Cleaning
(Refer to Cleaning, Disinfection and Sterilization Module)

xi. Handling of deceased bodies

Review your facilities policy.	Action
Determine if your province/territory has a regulation regarding this situation.	

xii. Handling of linen, waste, dishes and cutlery

	Explanation
Recommended precautions for handling linen, waste, dishes and cutlery	

xiii. Education (Discuss with mentor)

xiv. Visitor management

Visitor Management	Explanation
Review the visitor policy for your institution	
How are visitors alerted regarding these precautions?	
Who provides the visitors with education on hand hygiene and protective equipment?	
Is there a process for reviewing the visitors' practices of hand hygiene and PPE to determine if it is being done properly?	

xv. Aerosol generating medical procedures (AGMP)

An aerosol generating medical procedure (AGMP) is a medical or surgical procedure that involves manipulation of a patient's airway in a manner that may stimulate coughing and/or promote the generation of aerosols depending upon instruments and methods used.

Some examples include:

- Elective intubation and extubation
- Bronchoscopy
- Sputum Induction
- Autopsies
- Some procedures that occur in unplanned, emergent settings and can be life-saving such as cardiopulmonary resuscitation, emergent intubations and open suctioning of airways

It is prudent to avoid performing aerosol generating procedures on a patient with known or suspected respiratory infection unless medically necessary. Until the infectious disease is resolved, either delay the procedure (if clinically appropriate) or make procedural changes to the care performed to reduce the risk (e.g., choose to use an aero chamber instead of a compressor to deliver aerosolized medications).

When performing or assisting with a planned or urgent AGMP on a patient with known or suspected respiratory illness use a negative pressure room whenever possible and only those healthcare workers essential to performing the procedure should be in the room. All HCWs should wear a surgical mask and eye protection. If SARS, tuberculosis or an emerging pathogen is suspected, a N95 respirator should be worn while performing an AGMP until the mode of transmission and pathogenicity has been defined.

AGMP Exercise	
Define “aerosol generating medical procedure”	
Give 3 examples of procedures that are aerosol generating	
Give an example of a way to avoid generating aerosols	
What are the environmental controls that should be used for AGMPs?	
What PPE should be worn for the usual AGMP?	
Are there situations when one might use a higher level of respiratory protection?	

9. Additional Precautions

Routine Practices correctly and consistently applied will usually prevent transmission of infections by the contact route. However there are situations that may result in more contamination of the environment or that are spread through droplets or are airborne which need Additional Precautions.

Additional Precautions include:

- Contact Precautions
- Droplet Precautions
- Airborne Precautions
- Protective Precautions

i. Contact Precautions

Contact precautions are designed to interrupt the transmission of infectious agents spread by direct and indirect contact.

(a) Criteria to define direct or indirect contact

Item	Explanation/Recommendation
Direct contact Give the definition with disease examples	
Indirect contact Give the definition with disease examples	

(b) Infections spread by the Contact route

Find in your reading materials (the RPAP guideline) the list of diseases and recommended precautions and duration of precautions for the listed infections.

Infection/Condition	Precautions	Duration	Comments
Abscess, major – no dressing or draining does not adequately contain drainage			
Diarrhea, acute infective etiology suspected			
Antibiotic-resistant organisms (eg., MRSA, VRE)			
<i>Clostridium difficile</i> infection			

(c) Key components of Contact Precautions

Complete the following exercise to describe key considerations for each of the components of Contact Precautions:

Component	Key Considerations
Hand Hygiene	
Personal Protective Equipment	
Accommodation/Patient Placement	
Equipment (Refers to non critical patient equipment)	
Patient Transport	
Visitors (Explain the importance of family and visitor teaching)	
Why are Routine Practices used with Additional Precautions?	

(d) Cohorting for Contact Precautions

Although a private room is preferred for Contact precautions with own bathroom, it is not always possible. Describe the following points that must be taken into consideration if it becomes necessary to cohort patients:

Criteria for cohorting	Important Considerations
Roommate conditions	
Distance between patients	
Privacy curtains	

ii. Droplet Precautions

Droplet precautions are intended to prevent transmission of infectious agents that are spread by the droplet route.

(a) Criteria to define droplets

	Definition
How are respiratory droplets generated?	
What is the area of defined risk for transmission of droplet particles?	

(b) Infections spread by the droplet route

Find in your reading materials (the RPAP guideline) the list of diseases and recommended precautions and duration of precautions for the listed infections.

Infection/Condition	Precautions	Duration	Comments
Influenza			
Pertussis			
RSV			
SARS			

(c) Key components of Droplet Precautions

Complete the following exercise to describe key considerations for each of the components of droplet precautions:

Component	Key Considerations
Hand Hygiene	
Personal Protective Equipment	
Accommodation/Patient Placement	
Equipment	
Patient Transport	
Visitors	

(d) Cohorting for Droplet Precautions

Although a private room is preferred for droplet precautions, it is not always possible. Describe the following points that must be taken into consideration if it becomes necessary to cohort patients:

Criteria for cohorting	Important Considerations
Roommate conditions	
Distance between patients	
Privacy curtains	

iii. Airborne Precautions

Airborne precautions are intended to prevent transmission of infectious agents that are spread by the airborne route.

(a) Criteria to define airborne particles

	Definition
How are airborne particles generated?	
What is the area of defined risk for transmission of airborne particles?	

(b) Infections spread by the airborne route

Find in your reading materials (the RPAP guideline) the list of diseases and recommended precautions and duration of precautions for the listed infections.

Infection/Condition	Precautions	Duration	Comments
Tuberculosis			
Varicella			
Zoster			
SARS			
Novel respiratory virus			

(c) Key components of Airborne Precautions

Complete the following exercise to describe key considerations for each of the components of airborne precautions:

Component	Key Considerations
Hand Hygiene	
Personal Protective Equipment	
Accommodation/Patient Placement	
Equipment	
Patient Transport	
Visitors	
Source Control	

(d) Respirator use

Questions	Answers
When is a respirator use required?	
What is the difference between a mask (surgical/procedure) and a respirator?	
Is there a Respiratory Protection Program in your facility?	

Questions	Answers
Have you been fit tested for a respirator?	
What is a fit check?	
Demonstrate to your colleague the procedure for donning a respirator including doing the fit check.	

(e) Cohorting for Airborne Precautions

Although a private room with negative pressure is necessary for airborne precautions, it is not always possible. Describe the following points that must be taken into consideration if it becomes necessary to cohort patients:

Criteria for cohorting	Important Considerations
TB	
Measles/varicella	

(f) Immunization status of staff

The PPE required for care of someone on airborne precautions depends on the staff member's immunization status to the organism (s) involved (e.g. measles, varicella). However there are airborne organisms that cannot be immunized against. Look at the precautions required for immunized and non-immunized staff when looking at common airborne organisms and the differences between them.

Organism	Immunization status	Precautions
TB	Immune	
	Non-immune	
Measles	Immune	
	Non-immune	
Varicella	Immune	
	Non-immune	
Disseminated zoster	Immune	
	Non-immune	

iv. Protective Precautions

Protective precautions are meant to provide immunocompromised patients a safeguard against infections and infectious diseases.

(a) *Definition of immunodeficient patients*

	Examples
Provide 2 examples of severely immunodeficient patient conditions that would indicate the need for protective precautions:	

(b) *Key components of Protective Precautions*

Complete the following exercise to describe key considerations for each of the components of protective precautions:

Component	Key Considerations
Hand Hygiene	
Personal Protective Equipment	
Accommodation/Patient Placement	
Environmental Control	
Equipment	
Visitors	

(c) *Educational considerations for patients/family*

Describe the following educational information that should be provided to severely immunocompromised patients/family:

	Important Information
Skin care	
Dietary precautions	
Oral hygiene	
Preventing mucosal injury	

III. Methods

In this section you will have an opportunity to apply the knowledge you have learned in the key concepts sections to scenarios which you may encounter in your job as an ICP. Reflect on your readings and discuss difficult situations with your mentor so that you will be better prepared for real life situations.

1. Routine Practices

i. Patient placement and accommodation

Scenario	Determine the options for patient placement based on a PCRA and list the criteria which influenced your decision
Sam, a nurse in the Emergency Department, has a patient arrive who has an open draining wound on her abdomen, temperature of 38.9, chills and a foul odor noted from her abdomen wound. A recent culture found the microorganism methicillin-resistant <i>Staphylococcus aureus</i> (MRSA) in patient's wound. Patient is fifteen days post- op from a C-section.	
A 66 year old male is admitted overnight to a four bed ward. Patient has been unwell for several weeks experiencing decreased appetite, cough for over four weeks, night sweats, and has spiked a temperature since admission. The chest x-ray is showing some shadowing.	

ii. PCRA, PPE & HH

Scenario	Mary, a RN on the medical unit is assigned to care for a 70 year old female patient who has pneumonia and has a tracheotomy. Using PCRA determine when hand hygiene should occur and the other Routine Practices that are required when providing the following care activities:
Interaction	Required Routine Practices
Helping with personal hygiene (bed bath)	
Dispensing IV medications	
Performing trach care	
Helping with the use of bedpan	

iii. Handling of linen, waste, dishes and cutlery

Scenario	Action needed
You are on the patient care unit and you notice that the dinner tray of a patient on Contact Precautions has been left outside his room on the isolation cart. On inquiry you find out the dietary staff were afraid to go in the room. List in order the actions to address this issue.	

iv. Deceased body

Scenario	Action needed
The local funeral director calls you regarding the recommendation for the handling of a body of a patient who had a diagnosis of tuberculosis.	

2. Additional Precautions

There are situations you may encounter as an ICP that require the application of Additional Precautions. Determine the actions you would recommend if you encountered the following scenarios.

Scenario 1	
Questions	Recommendations
If this patient was admitted to your unit what type of precautions would be essential for all staff to use in order to safely care for her?	
What type of PPE would be used?	
Other than routine care of this patient, what medical interventions would require these PPE?	
What type of microorganisms would you be concerned about with this patient?	

What distance should be maintained from this patient if you are not wearing PPE?	
What type of instructions would be given to visitors?	
What type of accommodations would be required for this patient?	

Scenario 2	
Questions	Recommendations
What is your first action?	
What precautions would you take, if any?	
What type of room placement would you recommend? What type of source control would you need?	
What type of precautions would be required if the patient needed to leave the room for diagnostics?	
What special type of cleaning procedures (terminal clean) would be required?	

Scenario 3	
Questions	Recommendations
What type of precautions would be required to care for this patient?	
When would you employ these precautions and for how long?	
What type of PPE is required to be used?	
What room placement would be best suited for this individual?	

Scenario 4	
A 64 year old male presented to ER Dept 8 days post-op from a total knee replacement. His symptoms include redness, purulent drainage and pain at incision site and a temperature of 39.8. Seen by the family physician earlier in week who sent a swab for C&S. Patient did not receive the result. Culture checked and patient positive for MRSA. Patient admitted with diagnosis of cellulitis.	
What precautions would you take if any?	

Scenario 5	
A 42 year old female admitted to a four bed ward with hypertension. Patient had a sudden onset watery of foul diarrhea with additional four episodes within a few hours.	
What type of specimens would you recommend collecting?	
What precautions would you take?	

Scenario 6	
A 50 yr old female is admitted to the medical unit who has just completed an aggressive chemotherapy treatment regime and now presents with a fever. She is admitted with a post chemotherapy infectious process.	
Questions	Recommendations
What type of precautions should be employed on this patient?	
Who should not enter this patient's room?	
What type of PPE is required to be worn?	
Are any precautions necessary if the patient has to go outside her room for diagnostic reasons?	

Scenario 7	
A 35 yr old male was admitted to the ICU unit after being involved in gas explosion incident while doing repairs on a vehicle. He was admitted with extensive burns to over 75% of his body. He is on mechanical ventilation.	
Questions	Recommendations
What type of additional precautions would be required to care safely for this patient?	
What are you trying to prevent by placing this individual on precautions?	
Are there any individuals who should not be permitted to enter this patient's room?	
What type of PPE would be essential to be used by HCWs entering the room?	
What type of room placement would be suited for this individual?	
What types of education should be provided to visitors and other HCWs involved in the patients care?	

IV. Documentation and Reporting

There is no standard recommendation for the documentation of infection prevention and control activities in relation to recommendations made on specific patients or to specific groups. A review was done with the Network of Networks Special Interest Group of CHICA-Canada and there may be specific facilities with recommendations around documentation in the patient's chart.

Most nursing associations include documentation in the standards of practice recommendations. In Ontario there are two sites that may be of interest for those seeking further information on standards of practice. These are available at:

http://www.cno.org/Global/docs/prac/41001_documentation.pdf

http://www.cno.org/Global/docs/prac/41002_infection.pdf

The College of Registered Nurses of British Columbia

(<https://www.crnbc.ca/downloads/151.pdf>) gives the definition for documentation as follows:

Documentation

DEFINITION

Documentation is any written or electronically generated information about a client that describes the care or service provided to that client. Health records may be paper documents or electronic documents, such as electronic medical records, faxes, e-mails, audio or video tapes and images. Through documentation, nurses communicate their observations, decisions, actions and outcomes of these actions for clients. Documentation is an accurate account of what occurred and when it occurred.

Nurses may document information pertaining to individual clients or groups of clients.

This document also outlines reasons for documentation

REASONS FOR DOCUMENTATION

To facilitate communication

Through documentation, nurses communicate to other nurses and care providers their assessments about the status of clients, nursing interventions that are carried out and the results of these interventions. Documentation of this information increases the likelihood that the client will receive consistent and informed care or service. Thorough, accurate documentation decreases the potential for miscommunication and errors. While documentation is most often done by nurses and care providers, there are situations where the client and family may document observations or care provided in order to communicate this information with members of the health care team.

To promote good nursing care

Documentation encourages nurses to assess client progress and determine which interventions are effective and which are ineffective, and identify and document changes to the plan of care as needed. Documentation can be a valuable source of data for making decisions about funding and resource management as well as facilitating nursing research, all of which have the potential to improve the quality of nursing practice and client care. Individual nurses can use outcome information or information from a critical incident to reflect on their practice and make needed changes based on evidence.

To meet professional and legal standards

Documentation is a valuable method for demonstrating that, within the nurse-client relationship, the nurse has applied nursing knowledge, skills and judgment according to professional standards. The nurse's documentation may be used as evidence in legal proceedings such as lawsuits, coroners' inquests, and disciplinary hearings through professional regulatory bodies. In a court of law, the client's health record serves as the legal record of the care or service provided. Nursing care and the documentation of that care will be measured according to the standard of a reasonable and prudent nurse with similar education and experience in a similar situation.

Discuss with your mentor the documentation practice requirement for your facility.

Microbiology Module

Objectives

At the completion of a 4-6 week orientation period the ICP will:

1. Describe basic elements of microbiology that are pertinent to Infection Control
2. Provide information about specimen collection
3. Identify and interpret microbiology laboratory tests which have an impact on infection prevention and control

Number of hours

- Readings - 3 hours
- Activities - 4 hours

Required readings

- Information available in Appendix A
- CHICA-Canada presentation for novice practitioners- Introduction Microbiology
http://www.chica.org/Members/members_conf_presentations.php
- APIC Text of Infection Control & Epidemiology 2nd or 3rd Edition – Chapters 14, 15, 16, 17, 24, 25 & 63

Required text

- APIC Text of Infection Control & Epidemiology 2nd or 3rd Edition – Chapters 14, 15, 16, 17, 24, 25 & 63
- Bennett JV & Brachman PS. Bennett & Brachman's Hospital Infections. 5th ed. Ed. William R Jarvis: Philadelphia, PA, 2007 – Chapter 22

I. Overview

It is important to have a basic understanding of microbiology terms and organisms in order to interpret laboratory information into the infection prevention and control context.

II. Key Concepts

1. Key Terms

i. Define these key terms

Term	Definition
normal flora	
bacteria	
virus	
colonization	
infection	
disease	
Pathogenic	
non-pathogenic	
virulence	
opportunistic pathogens	
antibiogram	
aerobic organisms	
anaerobic organisms	
bacterial spores (endospores)	
endotoxins	
exotoxins	
antitoxins	
zoonosis	

ii. The Body's Response to Infection –

Describe these processes

Body's response	Description
Natural barriers	
Immune system (specific host mechanisms)	
Immune System (non-specific host mechanisms)	

2. Stages of Illness

Match the following stages of illness with the corresponding definitions

Stage of illness	Definitions
1.Invasion	a. maximum impact of illness when pathogen is proliferating rapidly – toxic by-products of microbial metabolism and immune response produce tissue damage
2.Incubation	b. pathogen replicating, no symptoms
3.Prodromal	c. pathogen acquires entry into the body mucus membranes inhalation, self inoculation
4.Acute Illness	d. pathogen is contained and eliminated from body, damaged tissue is repaired and resolution of symptoms

3. Bacteriology

i. Basic characteristics of bacteria

Term	Definition
Gram stain	
Gram positive	
Gram negative	
Culture & sensitivity	
Acid fast bacilli	
WBC versus epithelial cells	
Aerobic	
Anaerobic	

Term	Definition
Shape	
• Cocci	
• Diplococci	
• Bacilli or rods	
• Spiral forms	
• Pleomorphism	
Coagulase test – positive or negative	
Motility	

ii. Bacteria of interest

Learning objective: Identify the key characteristics and diseases most commonly associated with the following bacteria.

Bacteria	Shape – (Cocci, diplococci, bacilli)	Gram + or Gram -	Spore Forming Y or N	Common disease
<i>Staphylococcus aureus</i>				
Methicillin resistant <i>Staphylococcus aureus</i>				
Group A Streptococci (<i>Streptococcus pyogenes</i>)				
<i>Streptococcus pneumoniae</i>				
<i>Clostridium difficile</i>				
<i>Listeria monocytogenes</i>				
<i>Klebsiella pneumoniae</i>				
<i>Neisseria meningitidis</i>				
<i>Escherichia coli</i>				

Bacteria	Shape – (Cocci, diplococci, bacilli)	Gram + or Gram -	Spore Forming Y or N	Common disease
<i>Klebsiella Penumoniae</i>				
<i>Pseudomonas aeruginosa</i>				
<i>Treponema pallidum</i>				
<i>Mycobacterium tuberculosis</i>				
<i>Salmonella typhi</i>				
<i>Haemophilus influenzae</i>				

iii. Testing for bacteria -

Learning objective: Give explanations for the following questions.

	Explanation
What is a colony count?	
How are sensitivities tested?	
What is the practice implications of resistance to antibiotics	
Why is different growth media needed?	

4. Virology

i. Basic characteristics of viruses

(a) Key terms

Term	Definition
Obligate intracellular parasites	
Size of viruses	
Nucleic acid	
Shapes	
Enveloped versus	

Term	Definition
Non-enveloped viruses	

(b) Describe the 5 stage of virus replication

Viral Stage	Description
Attachment	
Penetration	
Replication	
Maturation	

ii. Viruses of interest

Virus	Envelope versus non enveloped	Importance to IPAC
Influenza virus		
Measles virus		
Respiratory syncytial virus (RSV)		
Mumps virus		
HIV		
Norovirus		

Interpret the following results for hepatitis b virus testing

Disease	Tests	Results	Interpretation
Hepatitis B	HBsAg	Negative	
	Anti-HBc	Negative	
	Anti-HBs	Negative	
Hepatitis B	HBsAg	Negative	
	Anti-HBc	Negative	
	Anti-HBs	Positive with \geq 10 IU/ml	
Hepatitis B	HBsAg	Positive	
	Anti-HBc	Positive	
	IgM anti-Hbc	Positive	
	Anti-HBs	Negative	

iii. Differentiate between viruses and bacteria

Characteristic	Viruses	Bacteria
Size and type of microscope to see organism		
Need a living host to multiply		
Has a cell wall and a cell membrane		
Usually tested for susceptibility to antibiotics		
Can there be beneficial types?		
Nucleic acid type		

5. Other organisms of interest

i. Fungi

Fungi are organisms that derive nutrients from organic matter. Most fungi are aerobes that require a moist environment and grow best at a neutral pH. Their spores and conidia are able to survive in dry conditions for long periods of time. Some fungi are well-adapted human pathogens however most are accidental pathogens that humans acquire through contact with decaying organic matter or in airborne spores. Typically fungi are divided into two separate groups: yeasts and molds. Common pathogenic yeasts include *Candida* spp. (vaginitis, mucositis) and *Cryptococcus neoformans* (meningitis, pneumonia in compromised individuals). Common pathogenic molds are *Aspergillus* spp. (necrotizing pneumonia) and agents of mucormycosis (*Rhizopus* and *Mucor* spp.). Some fungi can grow as either a mold or yeast (dimorphic fungi). Common pathogenic ones are *Pneumocystis carinii* and *histoplasma capsulatum* both which cause pulmonary infections.

Fungi	
Name	Describe a disease caused by this fungi and any infection control precautions recommended.
<i>Candida albicans</i>	

ii. Parasites

A parasite is an organism that lives in or on and takes its nourishment from another organism. A parasite cannot live independently. Parasitic diseases include infections by protozoa, helminths, and arthropods:

- Protozoa – Malaria is caused by plasmodium, protozoa, a single-cell organism that can only divide within its host organism.
- Helminths -- Schistosomiasis, another set of very important parasitic diseases, is caused by a helminth (a worm).
- Arthropods -- The arthropods include insects and arachnids (spiders, etc.), a number of which can act as vectors (carriers) of parasitic diseases.

Parasites	
Name	Describe disease caused by this parasite and identify any infection control precautions recommended.
<i>Giardia lamblia</i>	

III. Methods

As a critical component of this module will be allocated time to be spent with a preceptor in the Microbiology laboratory. Your mentor for the ICP orientation will arrange for this practice experience. In preparation for your time in the laboratory here are some exercises which you should do. If you need further clarification on the exercises you can bring them to your preceptor in the laboratory.

1. Contact Information

i. Local Laboratory

Key contacts	
Name:	
Location:	
Phone:	
Email address:	
Required contacts:	
Are there different labs for different tests – microbiology, serology etc? If yes, contact numbers for them.	

ii. Public Health Laboratory (PHL)

Key contacts	
Name:	
Location:	
Phone:	
Email address:	
Required contacts:	
Contact for Regional Medical Officer of Health	

2. Microbiology

i. Specimen Collection and Transportation

Learning objective: Describe the appropriate method for the collection, storage and transportation of specimens to the Bacteriology Lab.

Specimen collection and transport to the lab is an essential part of the culture process. In general, all specimens should be collected aseptically and placed in a sterile container, in

some cases specimens may be placed directly into culture media (e.g., blood cultures, genital cultures). Special handling techniques may be necessary for some specimens such as those for anaerobic culture. Prompt delivery to the laboratory is essential to prevent the death of pathogenic organisms or the overgrowth of commensal organisms. If transport is delayed, some specimens may be refrigerated (e.g., urine, stool, sputum) while others should be maintained at room temperature (e.g., genital, eye, or spinal fluid).

Specific procedures for specimen collection and transport are institution dependent. Please refer to your institution's laboratory manual for specific procedures and protocols.

Test	Usual transport medium	Important points on collection of the specimen	Common problems with specimen collection and transportation to lab	Usual test result time
Blood culture				
Wound Culture				
Urine culture				
Stool for C&S				
Stool for C diff				
MRSA screen				
VRE screen				
Throat culture				
Eye culture				
Sputum culture				
AFB smear/culture				

ii. Interpretation of Microbiology laboratory results

Review 2 or 3 microbiology requisitions and determine the laboratory significance.

Criteria	Laboratory significance
Demographics	
Date collected	
Time collected	
Diagnosis	

Criteria	Laboratory significance
Gender	
Person ordering the test	
Date received in lab	
Time received in lab	
Date reported	
Gram stain	
Mixed count	
Amount of growth	
Specimen number	
Cell count	
Organism	
Sensitivity	
Intermediate sensitivity	
Beta lactam positive	
Resistance	
Thymidine dependent strain tFG	
Source of the specimen Leg, vagina, etc. –	
Type of test required; ie., not viral studies but HSV	

Why is full work-up on stool not sufficient to guide the lab staff? Is it for c diff, salmonella, ova and parasites, etc?

3. Common microbiology requisition problems

Discuss with your preceptor if there are requisition problems commonly experienced in the microbiology and how they affect the testing methods and possibly the results.

Problems	Suggestions for improvement
Information not filled in correctly	

4. Virology

i. Specimen Collection and Transport

Test	Usual transport medium	Important points on collection of the specimen	Common problems with specimen collection and transportation to lab	Usual test result time
Stool for parasites				
CSF for viral studies				
Nasopharyngeal swab for RSV				
Nasopharyngeal swab for influenza				
Varicella zoster swab from vesicle				
Herpes simplex 1 & 2				
Buccal swab for mumps				
Stool for norovirus				
Stool for rotavirus				

ii. Testing for viruses

(a) **Direct examination methods for antigen detection:**

Unlike most bacteria, viruses are not complete cells that can function on their own. They cannot convert carbohydrates to energy, the way that bacteria and other living cells do. Viruses depend on other organisms for energy. And viruses cannot reproduce unless they get inside a living cell.

Learning objective: Describe methods for identifying viruses in the lab

There are three categories of diagnostic tests for viruses: i) Direct examination of the specimen ii) virus isolation (cell culture) and serology.

Test method	Give examples of two diseases where this testing is used	Type of sample required (urine, blood, nasopharyngeal etc.)
Antigen detection immunofluorescence		
Molecular techniques for the direct detection of viral genomes		
Electron Microscopy	Used primarily in the research setting. Currently not in use in NL	

(b) *Virus isolation method:*

Cell culture can take a long time thus it is not used often.

Test method	Give examples of two diseases where this testing is used	Type of sample required
Cell culture		

(c) *Serology methods for antibody detection:*

Serology forms the mainstay of viral diagnosis. Following exposure, the first antibody to appear is IgM, which is followed by a much higher titre of IgG. Detection of rising titres of antibody between acute and convalescent stages of infection, or the detection of IgM in primary infection are often used for diagnosis of viral infections.

Test method	Give examples of two diseases where this testing is used	Type of sample required
Enzyme linked immunosorbent assay (EIA)		
Particle agglutination		
Western Blot		

iii. Interpretation of Virology laboratory results

Review 2 or 3 virology requisitions and determine the laboratory significance.

	Significance on report
Date reported	
Igm	
PCR report	
IgM	
IgG	

5. Common requisition problems

Discuss with your preceptor if there are requisition problems commonly experienced in the virology laboratory and how they affect the testing methods and possibly the results.

Problems	Suggestions for improvement
Information not filled in correctly	

6. Public Health Laboratory

What tests are referred to PHL?	
Is there a different protocol for sending samples to PHL on week days versus week-ends?	
Is there a specific protocol for sending samples to PHL during an outbreak?	
Is there a requirement to have specific collection methods for samples which must be transported to PHL?	
How long does it take to get a report from PHL?	

Does PHL do a panel of virus on some respiratory samples? Is there a criterion around this procedure? For example is it done only on patients less than 5 years and over 75 years?	
Are samples for MRSA, VRSA, VRE, ESBLs, carbapenem resistance sent to the PHL routinely?	
Are any samples referred to the National Microbiology Laboratory?	
Discuss with your ICP mentor if you need to have a tour of the PHL	

7. Practice Microbiology Laboratory Experience

Follow a specimen from the time it is received in the laboratory until the report is finalized and sent to the ordering professionals.

i. Discussion with mentor

Item	Discussion
Get an understanding of how lab work is divided	
How long different tests take and why	
The differences in the type of media for different tests	
How that media is selected	
How contamination of the specimens is avoided	
Tests for identifying organisms	
Review antibiotic sensitivity testing	
How is a gram stain done	
How are reports generated	

ii. Observation of procedures

Observe the following procedures	
Procedures	Notes
Gram stain	
Sensitivity method	
Blood culture	
Specimen for AFB	
Urine culture	
Wound culture	

iii. Viewing of specific organisms on slides/plates

View the following slides/plates	
	Comments
<i>Staphylococcus aureus</i>	
<i>Streptococcus pneumoniae</i>	
<i>Mycobacterium tuberculosis</i>	
<i>Neisseria meningitidis</i>	
<i>Bordetella pertussis</i>	
<i>Streptococcus pyogenes</i> (Group A strep)	
Fungi	

IV. Documentation and Reporting

i. Laboratory reporting mechanism to IPAC

Criteria	Description
Determine the lab reports which are sent to IPAC on a daily basis	
How are routine reports sent to IPAC?	

Criteria	Description
Is there a process for stat reports to IPAC for TB, GAS, MRSA, VRE, ESBL, Carbapenem resistance?	
How long does the lab keep specific samples such as MRSA, VRSA, VRE, ESBLs?	

Responsibility of IPAC for laboratory reports

- Is there a designated surveillance program for certain microorganisms such as MRSA
- How are the reports stored i.e., database
- Who is responsible for entering the data
- Who is responsible for analyzing the laboratory data collected
- Are there reports generated from the data and to whom are these reports sent

V. Other Issues

1. Ethics

Discuss with your ICP mentor the steps which have been taken at your facility to ensure the confidentiality of reports

Appendix A

Terminology

- **colonization** – multiplication of an organism in or on a body surface without causing a tissue invasion or cellular injury or immune response. The person is “asymptomatic”.
- **infection** – multiplication of an organism in a host causing tissue invasion or cellular injury accompanied by an immune response – occurs with (pneumonia) or without clinical illness (HCV infection)
- **disease** – a pathological condition of the body that presents a group of symptoms peculiar to it and that sets the condition apart as an abnormal entity differing from other normal or pathological body states (CDAD)
- **pathogenic** – microorganisms that can cause disease and illness
- **non-pathogenic** – microorganisms that do not cause illness
- **virulence** – invasiveness, toxin production, ability to survive within the cell and cause illness
- **opportunistic pathogens** – microorganisms that do not usually cause infection except if the person’s immune system has been compromised
- **antibiogram** – antibiotic sensitivity patterns of the organisms being tested
- **aerobic organisms** – grows in the presence of oxygen
- **anaerobic organisms** – will not grow in the presence of oxygen
- **bacterial spores (endospores)** – produced by some Gram-positive bacilli –difficult to kill (used for sterilization testing)
- **endotoxins** –harmful substances released when bacterium dies which are toxic to host – primarily associated with gram negative bacilli
- **exotoxins** – harmful substances released into environment by living bacterium (i.e.) botulism, tetanus, diphtheria, some forms of food poisoning; exotoxin may be released from a small infected area into the bloodstream or absorbed from the gut
- **antitoxins** – chemicals produced to bind to the exotoxins to inactivate them
- **zoonosis** – from animals or animal products

Key information from Reading

Normal Flora

Microorganisms are found everywhere in nature and are also naturally present in and on humans. The term used for those microorganisms that can establish populations in a host, such as the human body, without causing disease is “normal flora”. The normal flora that acquires permanent populations is called “resident flora” and the microorganisms with temporary or semi-permanent populations is called “transient flora”.

The Body’s Response to Infection

Natural Barriers

- Skin and mucous membranes provide mechanical barriers
- Cilia of respiratory tract entrap organisms and cough mechanism expels them
- Gastric acid of stomach helps destroy some ingested pathogens, peristaltic waves prevent them from attaching and multiplying

- Mechanical flushing protects urinary tract
- Tears flush the eyes

Immune System

- Specific host defense mechanisms
 - Humoral (produces an antibody for each antigen recognized)
 - Cell mediated (macrophages and lymphocytes)
 - B lymphocytes and T-lymphocytes (4 types)
 - Regulatory, killer and suppressor and memory
- Non-specific host defense mechanisms
 - Can distinguish between self and non-self but not differentiate between antigens
 - Complement system: destroys pathogens by enabling the body to produce inflammation and facilitate localization of the infectious agent
 - Cytokines: influence other inflammatory cells, including macrophages, neutrophils and lymphocytes
 - Phagocytosis: injured cells and foreign substances (including microorganisms) are ingested by phagocytic cells (e.g. neutrophils, monocytes)
 - Fever is produced to augment the immune system, inhibit microbial growth, increase the rate of chemical reactions, raise the temperature above the organism's optimal growth temperature and decrease the individual's activity.

Stages of Illness

- Invasion – pathogen acquires entry into the body
- mucus membranes, inhalation, self inoculation
- Incubation – pathogen replicating, no symptoms
- Prodromal – initial appearance of symptoms (usually mild and vague)
- Acute Illness – maximum impact of illness when pathogen is proliferating rapidly – toxic by-products of microbial metabolism and immune response produce tissue damage
- Recovery – pathogen is contained and eliminated from body, damaged tissue is repaired and resolution of symptoms

Bacteria

Common Normal Flora	
Body Site	Common organisms
Mouth	<i>Staphylococci, S. viridans, Enterococci, S. pneumoniae, Neisseriae, Corynebacteria, Haemophilus, Enterobacteriaceae, Actinomyces, Lactobacilli, Bifidobacteria, Fusobacteria, anaerobic Gram neg. cocci, anaerobic Gram neg. cocci</i>
Upper Respiratory Tract	<i>Staphylococci, S. viridans, S. pneumoniae, Corynebacteria, Haemophilus, Propionibacteria, Actinomyces, Bacteroides, Fusobacteria, anaerobic Gram neg. cocci, anaerobic Gram neg. cocci</i>
Skin	<i>Staphylococci, Corynebacteria, Propionibacteria, anaerobic Gram neg. cocci</i>
Conjunctiva	<i>Staphylococci, Corynebacteria, anaerobic Gram neg. cocci</i>
Lower Intestine	<i>S. viridans, Enterococci, Corynebacteria, Enterobacteriaceae, Clostridia, Lactobacilli, Bifidobacteria, Fusobacteria, anaerobic Gram neg. cocci</i>
External Genitalia	<i>Staphylococci, S. viridans, Enterococci, Corynebacteria, Enterobacteriaceae, Bacteroides, Fusobacteria, anaerobic Gram neg. cocci</i>
Anterior Urethra	<i>Staphylococci, Enterococci, Neisseriae, Corynebacteria, Bacteroides, Fusobacteria, anaerobic Gram neg. cocci</i>
Vagina	<i>Staphylococci, S. viridans, Enterococci, Neisseriae, Corynebacteria, Lactobacilli, Bifidobacteria, Bacteroides, anaerobic Gram neg. cocci</i>

Bacteria are very small, relatively simple, single celled organisms. They contain a single long circular molecule of double strand DNA. This “bacterial chromosome” is not surrounded by a nuclear envelope and is attached to the plasma membrane. (apic)

The cell wall of bacteria is a rigid structure that maintains the shape of the cell and prevents bursting of the cell from the high osmotic pressure inside it. There are several different types of cell wall structures in bacteria, which have traditionally been categorized according to their staining characteristics. The 2 major types of cell walls are gram positive and gram-negative. In addition, some mycobacteria have an acid fast wall and mycoplasms have no cell wall.

A gram positive cell wall is composed of a very thick protective peptidoglycan layer. Because this layer is the principle component of the gram positive cell wall, many antibiotics effective against gram positive organisms act by preventing synthesis of peptidoglycan. Gram negative bacteria, which have a thinner pep and a different cell wall structure, are less affected by antibiotics.

The cell wall of the gram negative microbe is composed of two layers. The inner peptidoglycan layer is much thinner than in gram positive cell walls. Outside this layer is another outer membrane that is unique to the gram negative cell wall. The outer membrane contains proteins, phospholipids and lipopolysaccharide. This outer membrane

- Acts as a barrier to hydrophobic compounds and harmful substances
- Acts as a sieve, allowing water-soluble molecules to enter through protein-lined channels called porins
- Provides attachment sites that enhance attachment to host cells

Shapes of Bacteria (morphology)

(APIC)

Bacteria vary in size from 0.4-2 um. They occur in four basic shapes:

Cocci (spherical) – usually round but may sometimes be irregularly shaped. Cocci that remain in pairs after dividing are called diplococci and those that remain attached in a chain are called streptococci while those that remain attached in clusters or broad sheets are called staphylococci.

Bacilli (rod shaped) – most appear as single rods and are fairly uniform in shape although some are oval and look so much like cocci that they are called coccobacilli

Spirochetes (spiral shaped) – vary in length and in number of turns (micro text)

Pleomorphic: lack a distinct shape (like jello)

Mycobacteria

Are weakly grams positive but stain better with an acid-fast stain. This group includes organisms that cause tuberculosis and leprosy.

Mycoplasma (APIC)

Mycoplasmas are extremely small bacteria that lack cell walls and are surrounded only by an outer plasma membrane. Because they lack a rigid cell wall they are resistant to cell wall-active antibiotics (penicillins). Mycoplasmas associated with human infections are mycoplasma pneumoniae (atypical pneumonia), ureaplasma urealyticum (UTIs) and mycoplasma hominis (urogenital infections)

Other Cell Attributes

Surface polymers: some pathogenic bacteria produce a covering called a “capsule” which acts as virulence factors in helping the pathogen evade phagocytosis. Slime layers are similar to capsules but are more diffuse layers surrounding the cell. They also serve to inhibit phagocytosis or in some cases to aid in adherence to host tissue or synthetic implants.

Cell Appendages: flagellum is an organ of locomotion. They are exterior protein filaments that rotate and cause bacteria to be motile. Flagella that extend from one end of the bacterium are called “polar”. Flagella that occur on all sides of the bacterium are called peritrichous. Pili (also known as fimbriae) are hair like protein structures that aid in attachment to surfaces. Some (known as sex pili) are involved in bacterial conjugation and gene exchange. Proteins exist within the pili that aid in attachment and are called adhesins.

Endospores are formed by 2 genera of bacteria *Bacillus* and *Clostridium*. Endospores are dormant forms of bacteria that are resistant to heat, cold, drying and chemical agents. Spores form when there is a shortage of needed nutrients and can lie dormant for years. When the spore is exposed to a favorable nutrient or environment, it becomes active again.

Environmental factors influencing growth

3 factors influence the growth rate of bacteria: ph, temperature and gaseous composition of the atmosphere.

- Most bacteria of concern grow best at a neutral ph
- Bacteria that have adapted to humans grow best near body temperature
- Some require oxygen (obligate aerobes), some cannot grow in the presence of oxygen (obligate anaerobes) and some can grow either with or without oxygen (facultative anaerobes).

They also need:

- A source of carbon
- A source of nitrogen
- A source of energy (ATP)

Smaller amounts of elements such as phosphates and a variety of metals and ions must also be present.

All bacteria that inhabit the body are heterotrophic: require more complex substances for growth such as an organic source of carbon such as glucose and they obtain energy by oxidizing or fermenting organic substances. Often the same substance (e.g. glucose) is used as both a carbon source and energy source.

Fungi

Fungi are organisms that derive nutrients from organic matter. Most fungi are aerobes that require a moist environment and grow best at a neutral ph. Their spores and conidia are able to survive in dry conditions for long periods of time. Some fungi are well-adapted human pathogens however most are accidental pathogens that humans acquire through

contact with decaying organic matter or in airborne spores. Typically fungi are divided into two separate groups: yeasts and molds. Common pathogenic yeasts include *Candida* spp. (vaginitis, mucositis) and *Cryptococcus neoformans* (meningitis, pneumonia in compromised individuals). Common pathogenic molds are *Aspergillus* spp. (necrotizing pneumonia) and agents of mucormycosis (*Rhizopus* and *Mucor* spp.). Some fungi can grow as either a mold or yeast (dimorphic fungi). Common pathogenic ones are *Pneumocystis carinii* and *histoplasma capsulatum* both which cause pulmonary infections.

Viruses

Viruses were originally classified according to the diseases they caused or where they were found. Now they are classified by the type and structure of their nucleic acids, chemical and physical characteristics, size, type of replication and host. They are ultramicroscopic particles that contain nucleic acid (either RNA or DNA) surrounded by protein and in some cases other components such as a membrane-like envelope (APIC)

Viruses that contain only the viron are called naked viruses and are relatively stable to temperature, pH and chemicals. Viruses that wrapped in a membrane are called enveloped viruses and are more fragile because anything that disrupts their envelope inactivates them.

Outside the host cell the virus is known as a viron. A viron is metabolically inert and does not grow or multiply. All viruses replicate in a similar fashion: (APEC)

1. Attachment – the viron attaches to a receptor site on the host cell.
2. Penetration - the viron enters the host cell
3. Replication – viral DNA or RNA directs the host cell to begin synthesis of viral components. Replication uses host cell energy sources and amino acids to produce these components.
4. Maturation – the viral components essentially assemble into a viral particle spontaneously: baby viroids are formed
5. Release – the host cell breaks open or the virus buds through the cell wall and new viroids are released. Some viruses lie dormant in the host cell for months or years; after this latent period new viroids form and cause damage to host cells.

Common Infections and the Usual Organisms That Cause Them

Infection/site	Common Organisms
Bronchitis	<i>S. pneumoniae</i> , <i>H. influenzae</i> , respiratory viruses
Device-related	Coagulase-negative staphylococci, <i>Corynebacteria</i> sp.
Endocarditis	<i>S. viridans</i> , <i>S. aureus</i> , Enterococci
Gastroenteritis	<i>Salmonella</i> sp., <i>Shigella</i> sp., <i>Campylobacter</i> sp., <i>E. coli</i> 0157:H7, viruses
Meningitis	<i>H. influenzae</i> , <i>N. meningitidis</i> , <i>S. pneumoniae</i>
Pelvic Inflammatory Infection	<i>C. trachomatis</i> , <i>N. gonorrhoeae</i> , <i>Bacteroides</i> sp. Enterobacteriaceae
Pharyngitis	<i>S. pyogenes</i> , respiratory viruses
Pneumonia (community)	<i>S. pneumoniae</i> , <i>H. influenzae</i> , <i>M. pneumoniae</i> , <i>C. pneumoniae</i> , <i>M. tuberculosis</i>
Pneumonia (healthcare)	<i>Pseudomonas</i> sp. <i>S. aureus</i> , Enterobacteriaceae
Septicemia	<i>S. aureus</i> , <i>S. pneumoniae</i> , <i>E. coli</i> , <i>Klebsiella</i> sp., <i>Salmonella</i> sp.
Sinusitis	<i>S. pneumoniae</i> , <i>H. influenzae</i> , <i>S. pyogenes</i> , <i>S. aureus</i>
Skin	<i>S. aureus</i> , <i>S. pyogenes</i> , <i>Candida</i> sp., dermatophytes
Urinary Tract	<i>E. coli</i> , Enterococci, <i>Candida</i> sp., <i>Klebsiella</i> sp., <i>Proteus</i> sp.

Reviewing and Interpreting Culture Results

Specimens and Culture Results

1. Gather as much information as possible!!
2. Know what “normal flora” is and what potential “pathogens” are
3. Some specimen types such as sputum and feces will always contain organisms as “normal flora” and potential pathogens must be separated from them (i.e.) coughing up sputum will always be contaminated with saliva and potentially non-pathogenic organisms
4. Other specimens such as blood and CSF are normally sterile so any growth needs to be evaluated
 - Is it clinically significant? (is the person sick with symptoms)
 - Is it a contaminant? (skin contamination with blood collection)
 - Is it a transient loss of sterility? (transient bacteremia after brushing teeth)
5. Quantitative values – the quantity of organisms is expressed as colony forming units per liter (CFU/L) helps in identifying contamination from infection – used for urine testing (i.e.) counts > 100,000 usually considered a potential UTI
6. Number of positive cultures important (i.e.) the same organism isolated from blood and another site suggests bacteraemia arising from infection at that site
7. Clinical findings important in interpreting cultures (i.e.) signs and symptoms of dysuria and frequency of urination as important as urine culture in diagnosing UTI;
8. Person’s history important (i.e.) the presence of a prosthetic heart valve increases the likelihood of *coagulase negative staphylococcus* (CNS) in a blood culture representing endocarditis than when the person has no history of heart surgery.
9. Keep in mind that some heavily colonized wounds will heal spontaneously, and, conversely, some organisms are able to cause serious infection at much lower levels of colonization. Infection depends on the pathogenicity of the organism, the type of wound, and the patient’s response
10. Person’s who are immunosuppressed, on steroids or neutropenic have a greater chance of infection with “opportunistic pathogens” (i.e.) aspergillus in the sputum of a neutropenic person has more serious implications than in a normal host

Wound Culture

- If necessary, remove debris from the wound base
- Cleanse the wound with sterile normal saline or sterile water prior to
 - culture collection.
- **NOTE: Do not swab superficial eschar, or other necrotic tissue**
- Use appropriate sterile swab and culture medium – usually a sterile C&S swab.
- If wound is dry, moisten swab tip with sterile normal saline without preservative.
- Use sufficient pressure to cause tissue fluid to be expressed.
- For small wounds, using the side of the swab tip; roll it for one full rotation over the granulation tissue that has the most obvious signs of infection (avoid slough and surface purulent discharge).
- For larger wounds rotate swab over wound surface using a 10 point zigzag pattern.
- Place swab into culture medium.

Blood Cultures (APIC, ch 24)

- Preparation of the site will decrease the potential for a contaminated specimen. Tincture of iodine, isopropyl alcohol, chlorhexidine, or povidone-iodine combined with ethyl alcohol rather than povidone-iodine alone should be used for skin antisepsis prior to venipuncture for blood cultures, recognizing that studies have shown significantly reduced rates of contamination with use of these agents.
- 2 cultures taken from 2 separate sites, one of which is drawn from a peripheral vein by percutaneous venipuncture.
- At least 20 ml (preferably 30ml) is required (each specimen containing 10-15ml, inoculated into aerobic and anaerobic media).
- Up to 30% of blood cultures positive for coagulase-negative staphylococcus (CNS) represent true infection, however, the majority of single positive cultures represent contamination, a finding that should reemphasize the need to obtain cultures from two separate sites whenever BSI is suspected.

Urine Cultures (APIC, ch 25)

Clean-catch midstream specimens

- clean perineal area with skin antiseptic
- expose urethra with clean fingers
- void a small amount of urine before collecting to clear urethra of skin contaminants
- collect specimen from urine stream

Sterile specimens from an indwelling catheter or ileal conduit

- use sterile technique
- sample from diaphragm of catheter tubing
- Catheters that have been in place for an extended period of time may not reflect the microbiological status of the patient's urinary tract.
- urine should be obtained after catheter replacement for more reliable results

Transport urine specimens to lab as soon as possible. Culture within 2 hours of collection or refrigerated with no preservative.

Sputum Cultures (APIC ch 63)

- best collected early morning
- mouth should be rinsed and teeth or dentures cleaned
- sputum may need to be induced or suction used
- special precautions should be taken when TB is suspected
- if results show predominantly oral flora, the test is non-diagnostic
- transport promptly to the lab

Hand Hygiene Module

Objectives

- At the completion of a 4-6 week orientation period the ICP will:
- Demonstrate a basic knowledge of Hand Hygiene by completing the exercises in this module
- Describe the anatomy and physiology pertaining to skin and hands
- Understand the relationship between Hand Hygiene and the reduction of Health Care Associated Infection (HCAI) rates
- Identify the indications, methods, and techniques for performing Hand Hygiene
- Describe a Hand Hygiene program within the Infection Control Program of your facility using the key components of the Hand Hygiene program:
 - Purpose and objectives
 - Use of performance indicators (e.g., audit tools)
 - Staff Education and motivational programs
 - Policy
 - Strong commitment by all stakeholders
 - Communicating performance indicator results

Number of hours

- Readings – 4 hours
- Activities – 6-8 hours

Required readings

- CHICA-Canada Position Statement: Hand Hygiene
<http://www.chica.org/pdf/handhygiene.pdf>
- Safer Healthcare Now
<http://www.handhygiene.ca/English/Pages/default.aspx>
- Appendix A

Required texts

- APIC Text of Infection Control & Epidemiology 2nd or 3rd Edition-Chapter 19
- Bennett JV & Brachman PS. Bennett & Brachman's Hospital Infections. 5th ed. Ed. William R Jarvis: Philadelphia, PA, 2007 – Chapter 3

Other readings

- Accreditation Canada information at
<http://www.accreditation.ca/en/content.aspx?pageid=662&terms=hand+hygiene>

Ontario Ministry of Health and Long-Term Care/Public Health Division/Provincial Infectious Diseases Advisory Committee (PIDAC) - Best Practice Manual: Hand Hygiene in all healthcare settings. <http://www.oahpp.ca/resources/pidac-knowledge/best-practice-manuals/hand-hygiene.html>

Instructions

Read the material, complete the Hand Hygiene module and do the practice exercises. Write out your answers to the questions and discuss them with your mentor.

I. Overview

Hand hygiene has been identified as the most effective way of preventing the transmission of health care associated infection to patients, staff and visitors in all healthcare settings. Hand hygiene represents a new term in the healthcare vocabulary thus it is critical that all Infection Control Practitioners become familiar with the new terminology and the heightened emphasis placed on hand hygiene in healthcare settings.

II. Key Concepts

1. Background & Evidence for Hand Hygiene

i. Physiology of normal skin

Describe the physiology of normal skin.

ii. Transmission of organisms

Describe how healthcare associated pathogens are transmitted from one patient to another.

Define why adherence to Hand Hygiene is considered the single most important practice for preventing the transmission of pathogens in healthcare and directly contributes to patient safety.

What is the correlation between Hand Hygiene and health care-associated infections?

2. Hand Hygiene

Hand Hygiene is considered the most important and most effective infection prevention and control measure to prevent the spread of health care-associated infections (HAIs). Despite this compliance with Hand Hygiene protocols by health care providers has been and continues to be low ranging from 20-50 %.

i. Definitions

Complete the following exercise:

Define Hand Hygiene.
Describe the two correct methods for performing Hand Hygiene. i) ii)
Outline the factors to determine which method to use.
What is the preferred method for Hand Hygiene and why?

3. Indications for Hand Hygiene

i. Hand Hygiene Moments

List the Four Moments in Health Care in which Hand Hygiene **must** be performed.

-
-
-
-

List other recommended times Hand Hygiene should be preformed.

-
-
-
-

4. Hand Hygiene Technique

Correct technique is a fundamental part of Hand Hygiene.

i. Key considerations for Hand Hygiene technique

List the keys points of consideration in relation to Hand Hygiene.	
Adequate time	
Areas often missed	
Nail length	
Nail polish	
Artificial nails	
Rings/jewellery/bracelets	
Clothing	

ii. Compare Techniques

There are two available methods for performing Hand Hygiene which have strengths and limitations. Complete the following exercise:

	Alcohol-based Hand Rub	Traditional Soap and Water
Definition (Describe step by step the technique for each)		

	Alcohol-based Hand Rub	Traditional Soap and Water
Strengths	- - - - - -	- - - - - -
Limitations	- - - -	- - - -

iii. Other points to consider

No matter which method of Hand Hygiene performed, it is important to select the right products / agents.

List the keys points of consideration with each of the following:
Concentration of Alcohol for ABHR
Plain vs Antimicrobial Soap for Hand Washing
Staff usage (was the product trialed by front line workers?)
Ease of use

Why doesn't the use of gloves replace the need for Hand Hygiene?

III. Methods

1. Hand Hygiene Policy

Review your facility's Hand Hygiene policy.	
Is there a written Hand Hygiene Policy? How often is it required to be revised /updated? Where is it located?	
<p>From the list below select all elements that are included in your facility's Hand Hygiene policy.</p> <ul style="list-style-type: none"> <input type="checkbox"/> Indications for Hand Hygiene <input type="checkbox"/> Selection of Hand Hygiene agent <input type="checkbox"/> Management of soap containers <input type="checkbox"/> Management of alcohol-based hand rub containers <input type="checkbox"/> Hand lotion use <input type="checkbox"/> Use of alcohol-based hand rubs <input type="checkbox"/> Hand Hygiene monitoring and compliance audits <input type="checkbox"/> Mandatory requirements for employees, if yes please describe <input type="checkbox"/> Use of artificial nails, jewellery, length of nails, & nail polish 	
Do you have any suggestions on how the HH policy might be improved?	

2. Hand Hygiene Education Program

i. Review of present education program

Hand Hygiene (HH) Education Program	Comments
Does the facility have an HH education program?	
Outline staff education, including when, to whom, and how often	
Is HH education mandatory?	
Review the education program and determine if the following topics are covered <ul style="list-style-type: none"> <input type="checkbox"/> Importance of and indications for HH <input type="checkbox"/> Techniques for HH <input type="checkbox"/> Strategies to maintain healthy hands <input type="checkbox"/> Appropriate use of gloves <input type="checkbox"/> Healthcare worker perceived barriers to HH <input type="checkbox"/> Use of artificial nails, nail polish, length of nails & jewellery 	
Who has responsibility for the delivery of the HH education?	

ii. Education Tools

(a) Education exercise

Using the Canadian Patient Safety Initiatives Safer Healthcare Now! Web site at <http://www.saferhealthcarenow.ca/EN/HandHygiene/Pages/default.aspx> complete the HH education module.

After completing the module answer the following:	
Would you recommend this module for all health care workers?	
Does your organization have a Hand Hygiene education module available for the health care workers? If so how often are you required to complete the module and is it mandatory?	

(b) Teaching aids

Teaching aids such as the Glo-Germ have been used to reinforce technique and compliance with Hand Hygiene.

List any teaching aids available in your institution for Hand Hygiene education.	
Demonstrate the use of the Glo-germ to your mentor.	

(c) Posters

Review the posters available to promote Hand Hygiene in your facility	
How long have they been used?	
Is there a process to change them at certain intervals?	

(d) Hand Hygiene exercise

Demonstrate Hand Hygiene technique to your mentor	
Method	Comments
ABHR	
Soap and water	

(e) Hand Hygiene Compliance

Factors affecting compliance with Hand Hygiene	
List the factors that reduce compliance with Hand hygiene	
What are some ways to increase compliance with Hand Hygiene?	

(f) Occupational Health

Hand Care	
Does a strategy exist for hand care to promote healthy skin?	
What partners are involved in the hand care strategies?	
What is the process when health care workers present with breaks in skin integrity?	
List actions to promote hand care	

3. Hand Hygiene Agents**i. Agents**

Review the Hand Hygiene agents in use in your facility	
Is the IPAC staff involved with the tendering process for the Hand Hygiene agents? If yes, review the most recent tender.	
Soap <input type="checkbox"/> Type used <input type="checkbox"/> Bar soap use in your facility	
ABHR <input type="checkbox"/> Alcohol concentration <input type="checkbox"/> Formulation (gel, liquid or rinses) <input type="checkbox"/> Safety consideration <input type="checkbox"/> Placement of dispensers	
Antimicrobial soap <input type="checkbox"/> Indications for use	
Surgical hand antisepsis product	

4. Hand Hygiene Monitoring

i. Audit process

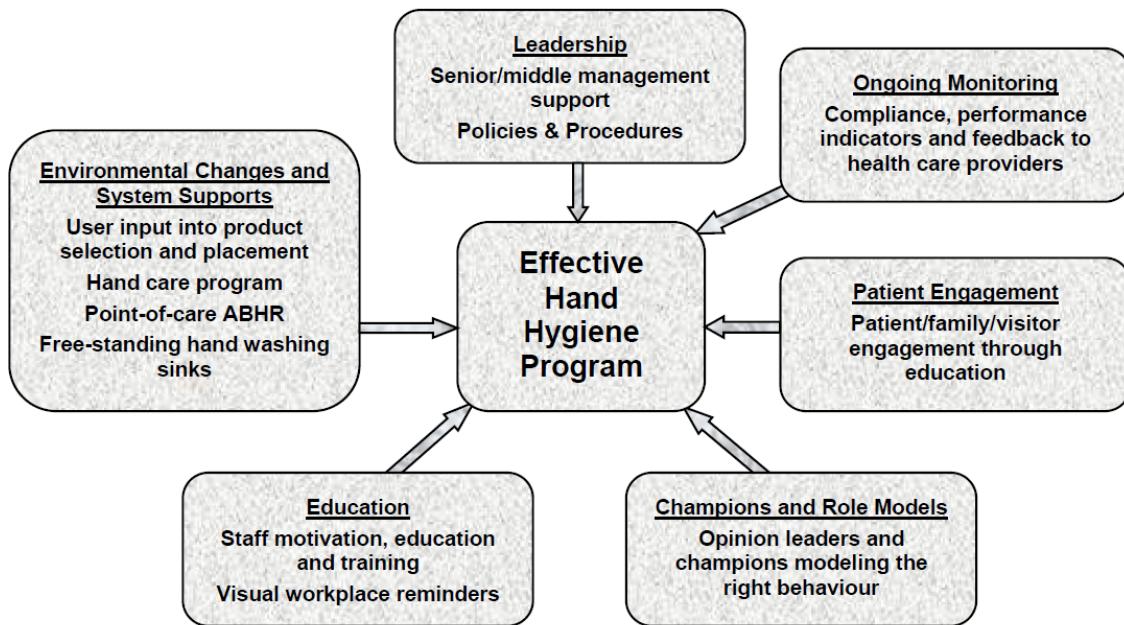
Review the Hand Hygiene audit process	
Is there a Hand Hygiene audit process for your facility?	
Who conducts the audits?	
Is there an education session for persons conducting the audit?	
Identify the methods used for collecting data to evaluate compliance?	
Who analyzes the data from the audits?	
How are the audits reported?	
Is staff provided with feedback from the audits?	
Who is responsible for implementing any changes recommended by the audits?	

5. Hand Hygiene Program

Although handwashing with soap and water has been considered a measure of personal hygiene for centuries the link between handwashing and the spread of disease was only established only two centuries ago. However during the past few years there has been great emphasis placed on Hand Hygiene in health care. Hand Hygiene has been promoted as a critical indicator of an institutions commitment to patient safety. Some of the programs which have been advocated include:

- Clean Care is Safer Care – World Health Organization
- STOP! Clean Your Hands – Canadian Patient Safety Institute – Safer Healthcare Now!
- Just Clean Your Hands – Ontario Ministry of Health & Long Term Care
- Cleanyourhands – England and Wales

The provincial Infectious Diseases Advisory Committee (PIDAC) in Ontario have advocated the following as key components of an effective Hand Hygiene Program.



Hand Hygiene Program	
Review the "Hand Hygiene Program" or Hand Hygiene strategies in your facility and determine if it has the following components.	
Leadership support • Policies & Procedures	
Education • Formal staff education • Posters	
Champions and Role Models • Administrative • Employee	
Patient Engagement • Strategies to engage patients • Posters	
Environmental Controls • Point of care ABHR • User input into the product & placement of product	
Ongoing Monitoring • Audits • Re-audits	

IV. Documentation and Reporting

As recommended by Bialachowski et al., in The Audit Process (CJIC Spring 2010) one of the steps to a successful audit is the post audit stage which includes: completing the summary score sheet, determining recommendations, meeting with stakeholders to discuss these findings and recommendations and preparing a final report including all recommendations. These recommendations must be distributed to the “appropriate person(s)”.

Documentation and Reporting	
If your facility completes audits of Hand Hygiene initiatives complete the following:	
Does IPAC meet with the stakeholders regarding the results of audit?	
Is a final report prepared for the stakeholders based on feedback from this meeting?	
Who receives the final report?	
Are items prioritized for action?	
Are there time lines as to when the items will be actioned?	
Is there a date set for a reaudit?	

V. Other Issues

1. Campaigns

Many institutions have used campaigns to promote Hand Hygiene in their facilities. This may include internal and external campaigns and the utilization of multimedia processes.

(i) Campaigns

Determine if your facility uses Hand Hygiene Campaigns.	
When is it held? For example during IPAC week? Or on World Hand Hygiene Day – May 5	
What are the components of the campaign?	
Any suggestions for improvements?	

Appendix A

Key Terminology

- **Alcohol-based Hand Rub (ABHR):** A liquid, gel or foam formulation of alcohol (e.g. ethanol, isopropanol) which is used to reduce the number of microorganisms on hands in clinical situations when the hands are not visibly soiled. ABHRs contain emollients to reduce skin irritation and are less time-consuming to use than washing with soap and water.
- **Antibiotic-Resistant Organism (ARO):** A microorganism that has developed resistance to the action of several antimicrobial agents and that is of special clinical or epidemiological significance.
- **Antimicrobial Soap/Antiseptic Soap:** Soap (detergent) that contains an antimicrobial agent (e.g., chlorhexidine, hexachlorophene, iodine compounds, triclosan, chloroxylenol/PCM) to reduce the numbers of microorganisms on the skin. Low concentrations of these chemical agents are often used as a preservative in liquid soap, but are not effective as an antimicrobial agent (see also *Plain Soap*, below).
- **Contamination:** The presence of an infectious agent on hands or on a surface, such as clothing, gowns, gloves, bedding, toys, surgical instruments, client/patient/resident care equipment, dressings or other inanimate objects.
- **Hand Washing:** The physical removal of microorganisms from the hands using soap (plain or antimicrobial) and running water.
- **Healthcare-associated Infection (HAI):** A term relating to an infection that is acquired during the delivery of health care (also known as *nosocomial infection*).
- **Infection:** The entry and multiplication of an infectious agent in the tissues of the host. Asymptomatic or sub-clinical infection is an infectious process running a course similar to that of clinical disease but below the threshold of clinical symptoms. Symptomatic or clinical infection is one resulting in clinical signs and symptoms (disease).
- **Infectious Agent:** A microorganism, e.g., a bacterium, fungus, parasite, virus or prion, which is capable of invading body tissues, multiplying and causing infection.
- **Plain Soap:** Detergents that do not contain antimicrobial agents or that contain very low concentrations of antimicrobial agents that are present only as preservatives.
- **Point-of-Care:** The place where three elements occur together: the client/patient/resident, the health care provider and care or treatment involving client/patient/resident contact. With respect to Hand Hygiene, the concept means that it is easily accessible to staff by being as close as possible, i.e., within arm's reach, to where client/patient/resident contact is taking place. Point-of-care products should be accessible to the health care provider without the provider leaving the client/patient/resident environment, so they can be used at the required moment.

- **Resident Bacteria:** Bacteria found in deep layers or crevices of skin which are resistant to removal with Hand Hygiene agents. These bacteria do not generally cause health care-associated infection and can be beneficial to the good health of the skin.
- **Routine Practices:** The system of infection prevention and control practices recommended by the Public Health Agency of Canada to be used with all clients/patients/residents during all care to prevent and control transmission of microorganisms in health care settings.
- **Transient Bacteria:** Bacteria found on the upper layers of the skin that are acquired during direct contact with clients/patients/residents, health care providers, contaminated equipment or the environment. Transient bacteria may be removed or killed by Hand Hygiene agents.
- **Visibly Soiled Hands:** Hands on which dirt or body fluids can be seen.

Cleaning, Disinfection & Sterilization of Medical Equipment/Devices Module

Objectives

At the completion of a 4-6 week orientation period the ICP will:

1. Demonstrate a basic knowledge of cleaning, disinfection and sterilization of medical equipment/devices by completing the exercises in this module.
2. Describe the Spaulding Classifications System and give examples of each category.
3. Outline the key points for workflow, transportation and storage of medical equipment/devices for Central Supply Reprocessing (CSR), Operating Rooms (OR) and Endoscopy departments

Number of hours

- Readings – 4-6 hours
- Activities – 4-8 hours

Required reading

- Best Practices for Cleaning, Disinfection and Sterilization of Medical Equipment/Devices, PIDAC, Feb 2010
<http://www.oahpp.ca/resources/documents/pidac/Best%20Practices%20for%20Environmental%20Cleaning.pdf>

Additional readings

- Hospital Infections Bennett & Brachman's 5th Edition, Chapter 20; p 303
- APIC Text- 3rd Edition-Volume 1 Chapter 21. Cleaning, Disinfection, and Sterilization in Healthcare Facilities.
- Decontamination of Reusable Medical Devices. Canadian Standards Association.
- CSA-Z314.8-08
- Regional Infection Control Network (RICN), SPD Tour Activity List, pg 29. Available at:
<http://ricn.on.ca/photos/custom/TCICNfiles/Acute%20Care%20ICP%20Orientation%20Binder.pdf>
- Infection Prevention and Control Guideline for Flexible Gastrointestinal Endoscopy and Flexible Bronchoscopy found at: <http://www.phac-aspc.gc.ca/nois-sinp/guide/endo/index-eng.php>

Instructions

Read the material. Write out your answers to the questions and discuss them with your mentor. Your Mentor should contact department managers to arrange tours.

I. Overview

This module is designed to help you become familiar with the processes involved in the reprocessing of medical devices/equipment. The goals of safe reprocessing of medical equipment/devices include:

- Preventing transmission of microorganisms to personnel and clients/patients/residents: and
- Minimizing damage to medical equipment/devices from foreign material (e.g., blood, body fluids, saline and medications) or inappropriate handling (PIDAC, 2010).

One of the roles of the Infection Control Practitioner is to provide advice on the cleaning, disinfection and sterilization of patient care equipment. In this module you will be asked to become familiar with key concepts for reprocessing. After you are familiar with these concepts take a tour of the departments that provide reprocessing services. Use the check lists provided under the tour section to help guide you and to document your experiences.

II. Key Concepts

An important place to start is with Spaulding's Classification System. This system was first proposed in 1968 and is so clear and logical that it has been retained by the Infection Control community and others involved in cleaning, disinfection and sterilization processes. Spaulding believed that the nature of disinfection could be understood more readily if instruments and items for patient care were divided into three categories based on the degree of risk of infection involved in the use of the items.

In the section below define each of the device classifications. Identify the method of reprocessing used for each of the classifications and then give an example of medical devices that fall into each of the categories based on the definition of each device classification.

i. Spaulding Classification

Spaulding Classification			
Device Classification	Definition	Device Examples	Method for Reprocessing
Critical			
Semi critical			
Noncritical			

In section (ii) and (iii) define key terms about cleaning and disinfection and then give examples.

ii. Cleaning

Cleaning Definitions		
Term	Definition	Examples
Cleaning		
Detergents		
Enzymatic cleaner		

iii. Disinfection

Disinfection Definitions		
Term	Definition	Examples
Disinfection		
Disinfectant		
Antiseptic		
Low level disinfection		
High level disinfection		

iv. Disinfectants

There are many disinfectants in use in the health care setting. The following disinfectants are commonly used so it is important to have an understanding of their advantages and disadvantages

Disinfectant	Advantages	Disadvantages	Main use in your hospital
Alcohol			
Chlorine (Bleach)			
Glutaraldehyde			
Ortho-phthalaldehyde (OPA)			
Quaternary ammonium compounds			
Hydrogen peroxide			

Disinfectant	Advantages	Disadvantages	Main use in your hospital
Accelerated hydrogen peroxide			
Peracetic Acid			

Often chemical high level disinfectants/sterilants have a process in place to test the quality of the product. Review the products that must be tested with quality indicator strips in your facility.

Indicator	Define	Examples of with what products they are used.
Test Strips		

v. Sterilization

Define sterilization and methods to achieve and monitor sterilization.

Term	Definition
Sterilization	

Sterilization Methods	Definition	Disadvantages	Advantages
Steam sterilization			
Hydrogen peroxide gas plasma			
100% Ethylene oxide (ETO)			
Chemical sterilant			
Flash sterilization or immediate-use sterilization			
Event related sterility			

Indicator	Define	Type used
Biological indicators		
Chemical indicators		
Physical indicators		
Bowie Dick Test		

Manufacturer's recommendations

Manufacturer's information for all medical devices/equipment must be easily accessible to staff carrying out the reprocessing. List the information that the manufacturer must provide with each medical device.

III. Methods

Before you go on a tour of the departments listed below become familiar with these concepts. Read and understand Best Practices for Cleaning, Disinfection and Sterilization of Medical Equipment/Devices (see required reading).

1. Key Concepts

Cleaning – Process	
Why is cleaning the first step of reprocessing?	
Describe the steps involved in the cleaning of medical devices.	

 Important to know!
How should contaminated equipment or devices be transported to the reprocessing area?

Disinfection – Process
Why is important to classify the device before determining the disinfection method?

 Important to know!
What is the difference between cleaning and disinfection?

Cleaning/Disinfection of non critical items				
Item	Cleaning/disinfection (c/d) recommendations	Product used in your facility for c/d	Who is responsible for c/d it?	How often is it cleaned /disinfected? Or is it single use?
B/P cuff				
Patient sling				
Bed pan				
Stethoscope				
Glucometer platform				
Electronic thermometers				
IV poles, wheelchairs, beds, call bells				

Cleaning/Disinfection of semi-critical items				
Item	Cleaning/disinfection (c/d) recommendations	Product used in your facility for c/d	Who is responsible for c/d it?	How often is it cleaned /disinfected?
Flexible endoscopes that do not enter sterile cavities or tissues				
Anaesthesia equipment				
Endotrachial tubes				
Ear cleaning equipment, ear curettes, otoscope tips				
Breast pump accessories				
Pessary and diaphragm fitting rings				

Sterilization Methods of critical items		
Sterilization Methods	Where is it done in your facility?	Example(s) of medical device
Steam sterilization		
Hydrogen peroxide gas plasma		

Sterilization Methods	Where is it done in your facility?	Example(s) of medical device
100% Ethylene oxide (ETO)		
Chemical sterilant		
Flash sterilization		

 STOP	Important to know!
Describe the process for managing single use items? Identify some single use items in your facility, e.g., breast pump equipment, AV fistula clamps, patient eye shield for CT scan, and EEG hats	

 STOP	Important to know!
What is the difference between disinfection and sterilization?	

 STOP	Important to know!
What is Best Practice for the Storage of Reprocessed Medical Devices?	

2. Tours of Key Reprocessing Areas

There are specific departments within facilities which perform the majority of the cleaning, disinfection and sterilization of medical devices. These departments include the Medical Device Reprocessing (MDR), the Operating Room (OR) and the Endoscopy Department. It is important that you become familiar with these areas. **Have your mentor contact the manager of these departments and arrange a tour.** Below are things you need to look for and ask about.

i. MDR Tour

MDR Tour	Document Your Experience
<ul style="list-style-type: none"> • Workflow contaminated to clean and then sterile • Follow an item/tray through decontamination, cleaning, and sterilization • Tray of surgical instruments versus a bed pan 	
<p>Ask to see the follow:</p> <ul style="list-style-type: none"> • Bowie Dick Test • Biological indicators • Chemical indicators • Physical indicators • Documentation and recording of indicators • What is the process when there is a positive indicator? 	
<ul style="list-style-type: none"> • Review the pasteurization process 	
<ul style="list-style-type: none"> • Review the use of an <ul style="list-style-type: none"> i) ultrasonic cleaner ii) washer disinfector 	
<ul style="list-style-type: none"> • Does the MDR have policies and procedures? 	
<ul style="list-style-type: none"> • Where do they keep manufacturers recommendations? 	

Routine Practices	Document Your Experience
Does the area have dedicated hand hygiene sinks?	
PPE used <ul style="list-style-type: none"> • Gloves • Gowns • Face protection • 	
Observe hand hygiene practices	

ii. OR Tour

Operating Room (OR) Tour		Document Your Experience
Mentor should: Identify a key contact in the OR and arrange a tour		
Discuss with your facilitator if any reprocessing is being done in the OR		
Are the items cleaned in the OR prior to being sent to CSR? If yes, by whom and where?		
Is flash sterilization being done in OR? How often? Which equipment?		
Identify reprocessing policies		
Observe the reprocessing practices of medical devices in the OR (it may be cleaning only)		

Routine Practices		Document Your Experience
Does the area have dedicated hand hygiene sinks?		
PPE used <ul style="list-style-type: none"> • Gloves • Gowns • Face protection 		
Observe Hand hygiene practices		
Any other comments on the visit...		

iii. Endoscopy Unit Tour

Endoscopy Tour	Document Your Experience
Mentor should identify key contact in department Arrange a tour	
Are any scopes being reprocessed in other departments?	
Follow one endoscope from the patient through reprocessing to storage	
Identify the policy for reprocessing the scopes <ul style="list-style-type: none"> • Date of policy/procedure • Is IP&C department consulted on the policies/procedures 	
Does staff have access to manufacturers recommendations	

Routine Practices	Document Your Experience
Does the area have dedicated hand hygiene sinks?	
PPE used <ul style="list-style-type: none"> • Gloves • Gowns • Face protection 	
Observe Hand hygiene practices	

iv. Document your experience

When you are on the tours of departments that participate in reprocessing consider these items while on your tour.

Transportation & Handling of Contaminated Medical Equipment/Devices	Document Your Experience
How is contaminated equipment transported to the Reprocessing Department or	

Transportation & Handling of Contaminated Medical Equipment/Devices	Document Your Experience
reprocessing area? • within facilities (department to department) • between facilities,(vehicle transport, staff training certification for transportation of hazardous goods)	
Does the way devices are transported meet best practice standards?	
Do the policies and procedures include information on transportation of contaminated equipment or medical devices?	

Storage of Reprocessed Medical Equipment/Devices	Document Your Experience
Where are sterile items stored?	
Are items stored in a way that meets the best practice standards?	
Review policy/procedure regarding the storage of sterile equipment.	

IV. Documentation and Reporting

Documentation	Comments/Recommendations
Does your facility have a policy for reprocessing reusable medical devices?	
Does your facility have a policy on the management of single use devices?	

Additional Notes:

Outbreak Module

Objectives

At the completion of a 4-6 week orientation period the ICP will:

Demonstrate a basic knowledge of outbreak management by completing the exercises associated with the case study provided specifically to be able to:

- define outbreak
- identify ways in which an outbreak might be identified
- explain how to confirm the existence of an outbreak
- identify the purpose of a case definition and how to find/create a case definition
- identify strategies for finding additional cases
- identify stakeholders who will need information and the type of information they need
- outline the steps in outbreak investigation and management, illustrating each step with an example
- outline the key points to include in an outbreak report

Number of hours

- Readings – 6 hours
- Activities – 6 hours

Required reading

- Appendix A – Outbreak Management Notes (this module)
- APIC Text: 3rd Edition, Chapter 4 (4-1, to 4-10)

Other readings

- Bennett and Brachman (2007) Chapter 7 - Investigating Endemic and Epidemic Healthcare-Associated Infections (p 91-107)
- CHICA Canada Audit Tool
http://www.chica.org/AuditToolkit/Tools/tools_Enteric_Outbreak.pdf
- PICNet BC
GI Outbreak Management Guidelines (2010) and Respiratory Illness Outbreak Management Guidelines (2011) <http://picnetbc.ca>
- Ontario Ministry of Health
Control of Gastroenteritis Outbreaks in Long-Term Care Homes Sept 2011
- Public Health Agency of Canada. National Notifiable Diseases List. Retrieved Feb 3, 2012 from <http://dsol-smed.phac-aspc.gc.ca/dsol-smed/ndis/list-eng.php>
- NL provincial guideline for management of norovirus
http://www.health.gov.nl.ca/health/publichealth/cdc/norovirus_management.pdf
- NL Disease Control Manual – Steps for outbreak management
http://www.health.gov.nl.ca/health/publications/diseasecontrol/DCM_Introduction_May_2010.pdf

Find your own facilities policy and procedure and becoming familiar with it. Also explore what preventative measures are in place and what educational tools, signs etc. are available.

I. Overview

Outbreaks are defined as an increase over the expected occurrence of an event. The terms “outbreaks” and “epidemic” are frequently used interchangeably. A small rise in events may be referred to as a “cluster” and both “clusters” and “outbreaks” require prompt investigation and management. To identify an outbreak baseline endemic rates must be available for comparison. This is the reason for conducting surveillance. Outbreaks may occur for a number of reasons including: introduction of and transmission of an infectious disease within the healthcare site, lapses in infection control practices, contaminated or defective products or devices and establishment of a reservoir for a pathogen somewhere in the healthcare site. While outbreaks will continue to occur, many can be prevented or have their impact reduced through intentional, knowledgeable and rapid management.

II. Key Concepts

Instructions:

Read the material and do the practice exercises. Write out your answers to the questions and discuss them with your mentor.

1. Key Terms

i. Define these key terms

Definitions – Define the following terms	
Term	Definition
Outbreak	
Epidemic	
Endemic	
Pandemic	
Cluster	
Sporadic	
Outbreak	
Pseudo-outbreak	
Line list	
Epidemic curve	

Common Source	
Propagated Outbreak	
Attack rate	

ii. Reasons for investigating a presumed outbreak

List five reasons for investigating an outbreak.

1.	
2.	
3.	
4.	
5.	

iii. Recognizing an Outbreak

a. Surveillance information

Potential outbreaks may be suspected when healthcare-associated infections occur above the background rate or when an unusual microorganism is recognized. There are several avenues for identifying outbreaks. Complete the table below:

Avenue	Information that may identify an outbreak
Laboratory	
Patient Care Unit	
Admissions form	
Media	
Where else?	

b. Clinical information

Although it is often not initially clear what the source of the outbreak may be it is important to think about this from the beginning. The type of specimens to collect and send may depend upon the source suspected (e.g. food borne versus viral pathogen).

To determine this one must understand the possible common sources, potential modes of transmission, usual reservoirs, incubation periods and the microbiological traits of the pathogen of concern. This information will enable one to formulate a hypothesis, initiate the appropriate observation strategy and ensure the correct specimens are collected and sent. The ability to identify the source will provide information that will be helpful in bringing the outbreak to an end.

Complete the table below:

Clinical symptoms	Possible sources
Fever, cough, dyspnea in several patients	
Vomiting, diarrhea in several patients	
Infected surgical wounds in several patients (same surgery) in the same week	
Variety of non-incisional post-op infections caused by the same organism	
Several patients with itchy skin rashes	

iv. Steps in outbreak management

The steps for outbreak management have been described in many text books and guidelines (see Appendix A). Although they have many of the same steps they differ in the progression of the steps. As an ICP please reflect on the actions that you would consider if you were called to investigate an increase in the number of cases of an infectious nature.

Using Appendix A as a guide or referring to the Outbreak Management policy of your facility list at least 10 steps for outbreak management.

III. Methods

In this section you will have an opportunity to apply the knowledge you have learned in the key concepts sections to scenarios which you may encounter in your job as an ICP. Reflect on your readings and discuss difficult situations with your mentor so that you will be better prepared for real life situations.

Case Study

On September 1, 2011 Nurse Marion noted that Mr. Jones in Ward A on Unit B had 3 loose stools during the 12 hour night shift. It was a very busy surgical unit working at full capacity of 20 beds. Marion noted the following information about Mr. Jones:

- 60 year old married male
- History of cancer of the bowel
- Abdominal surgery 5 days earlier
- Nasogastric tube removed on August 31
- Started on clear fluids today
- Poor hygienic practices
- Mrs Jones providing help with his care

On September 2, 2009 Mrs. Jones helped her husband with his care including helping him to the bathroom several times during the day and evening. She forgot to mention this to his nurse as it was normal for him to have several stools per day prior to his surgery.

On September 3, 2009 Nurse Marion was on day duty and was assigned to Ward A. On entering the Unit she remembered that she had forgotten to report that Mr. Jones had had 3 loose stools when she did the night shift. When she asked Mr. Jones how he was doing he told her of his continuing problem with loose stools which he thought the surgery was going to remedy. He told her of having to go to the bathroom 5 times since midnight. A stool from Mr. Jones was sent to the laboratory for C& S. The other three patients from September 1 had been discharged and three new patients were in the unit; 2 admitted on September 2 and one during the night. During the day (Sept. 3) two of the patients admitted on September 1 complained of nausea.

On September 4 the two patients with nausea were now having diarrhea, the ICP (you) was notified.

Work through this study with your mentor, answering the following questions and using them to stimulate conversation around control methods, communication to patients, staff and public, education to patient's staff and public and the roles and responsibilities of the various people at your site.

You are the ICP that is notified of this situation. Let's assume that your office is at this facility. Given what you have just learned:		
Step 1 Determine if an outbreak exists	<ul style="list-style-type: none"> • What is the first thing you should do? 	
	<ul style="list-style-type: none"> • Who would be sources of information about the cases? 	
	<ul style="list-style-type: none"> • How would you rule out alternative causes? 	
	<ul style="list-style-type: none"> • Consider the possible diagnosis and think of the possible causes, the incubation periods and the typical signs and symptoms. 	
	<ul style="list-style-type: none"> • Can you use the chain of infection to help identify the cause of this event? 	
	<ul style="list-style-type: none"> • What specimens would you send (if any)? 	
	<ul style="list-style-type: none"> • If this event occurred during the week-end or holidays, how would you arrange for specimens transfer to the laboratory? 	
	<ul style="list-style-type: none"> • What information would you collect on the line list? 	
	<ul style="list-style-type: none"> • What would you tell staff about monitoring their own health? 	
	<ul style="list-style-type: none"> • What would you advise the staff regarding working on other units/facilities? 	
	<ul style="list-style-type: none"> • Any other things you would suggest? 	
	<ul style="list-style-type: none"> • Look at your surveillance data and see if this is normal trend for this unit? Would you expect this number of cases on this Unit? 	

Step 2 Implement immediate control measures	• What infection control measures would you recommend?	
	• Is the signage available?	
	• Is there a fact sheet about gastrointestinal infections?	
	• Where would you get extra gowns and gloves for this situation?	
	• Who will notify the patient, family and others of this event?	
	• Who will notify the Medical Officer of Health (MOH)? When will you notify the MOH?	
	• How will you determine if there is a need for education sessions relating to this outbreak?	
	• Who gives this educational session?	

Step 3 Confirm the existence of an outbreak/establish a case definition	What would you consider the case definition?	
	How long does it take to get the results of the tests that you requested?	

Step 4 Assemble the team	Does your facility have an outbreak management team?	
	Who should be on this team?	
	What would be the responsibility of the communications expert?	
	Who needs to know about this outbreak?	
	When will you close the ward/facility to visitors/admissions?	

	How often should you meet?	
	Is there a sample agenda ready for outbreak meetings?	
	Explore with your mentor the process for assembling a team if the outbreak occurs on a week-end.	

Step 5 Ongoing monitoring Communication	Who is at risk of becoming ill on the Unit?	
	Are you responsible for analyzing and interpreting the data?	
	Evaluate the overall investigation and response; is there anything else you should do now?	
	Who else might you be communicating with as the outbreak continues? (external & internal)	
	How do you communicate to other employees, the community and family members re this outbreak?	
	Is there legislation in your province regarding the reporting of outbreaks?	

Step 6 Declaring the outbreak over	What criteria could be used to indicate that the outbreak is over?	
	Who can declare the outbreak over in your facility?	

Step 7 Debriefing the staff	Who is responsible for doing this at your facility?	
	How will you do this?	
	Do you have an outline of activities to discuss?	

Step 8 Writing the report and recommendations	Why write a report?
	What are the key elements of a report?
	Why is it important to include recommendations sections?
	Who should get the report?

If you would like to do another case study focusing on respiratory illness, it is available in Appendix B.

IV. Documentation and Reporting

Determine the roles and responsibilities for outbreak management in your facility. Is there a reporting requirement to the Regional Medical Officer of Health? In Newfoundland Labrador, there is a Notifiable Disease List (Appendix D). Do you have to report through an electronic system to the province?

V. Other

Audits

CHICA-Canada has an outbreak audit tool available for the management of enteric outbreaks. You can access this tool at the following web site:

<http://www.chica.org/AuditToolkit/toolkithome.php>

Appendix A

Pre-Outbreak Prevention and Preparedness

Organizational leadership is critical in all health care settings to ensure effective outbreak prevention and control. Ideally, all facilities should have a designated Outbreak Prevention and Management Team (OPMT). This group is responsible for ensuring that measures for preventing outbreaks are in place and for directing and overseeing the management of all aspects of any outbreak. OPMT members should have decision making authority for their discipline within the facility or unit. A lead person from this group should be appointed to coordinate daily meeting(s) during an outbreak. The membership of an OPMT will depend upon the facilities location, size and contractual status.

Membership may include:

- A medical advisor (if available)
- Infection control physician (if available)
- Medical Health Officer or delegate
- An administrator
- A Director of Care
- An ICP or person responsible for infection control of that site
- An Occupational Health Nurse or person responsible for occupational health
- An Environmental Health Officer or alternate (e.g. Community Care Facility Licensing Officer)
- A laboratory manager or representative
- A person responsible for support services such as housekeeping and laundry
- A foods services supervisor
- Communications coordinator
- Front line HCW representative (e.g. charge nurse)

A written process for Outbreak Management which includes current membership of the OPMT with contact information should be available to all health care professionals. All point of care providers should have a basic understanding of when to become alerted to the possibility of an outbreak. They should also be able to locate outbreak control information so that they can initiate control steps at any time of the night or day or day of week (e.g. long weekend).

Steps in Outbreak Management

The steps for outbreak management vary slightly depending on the source of your document. The table below gives an overview of the different steps from different organizations. Although they are not exactly alike they are pointing out the importance of the need to have an organized approach to outbreak management. The steps do not happen in a completely linear fashion; often one or more steps are occurring simultaneously. Review the required reading to establish the actions which occur at each step.

Table 1 – Steps for Outbreak Management according to i) Skills Enhancement for Public Health ii) APIC Text – required reading iii) Disease Control Manual (DCM) – Newfoundland Labrador (NL)

	Skills Enhancement for Public Health – Outbreak Module	APIC 2nd edition – required reading	DCM - NL
1	Determine if an outbreak exists	Prepare for the investigation/field work	Determine if an outbreak exists
2	Confirm the diagnosis	Confirm that an outbreak exists	Confirm the diagnosis
3	Assemble the team	Establish or verify diagnosis of reported cases; identify agent	Assemble team
4	Define cases and initiate case finding	Search for additional cases; collect critical data; develop a line listing; collect specimens if indicated	Implement immediate control measures
5	Implement immediate control measures	Characterize the cases by person, place and time	Define case
6	Orient the data in terms of time, person, and place	Take immediate control measures, if indicated	Orient data in terms of person, place and time
7	Determine who is at risk	Formulate tentative hypothesis(making the best guess to explain the observation)	Determine who is at risk
8	Generate and test hypotheses	Test hypothesis(hypothesis should explain the majority of cases)	As required by disease Case history Clinical specimens Environmental assessment Food samples
9	Define objectives for further research	Plan an additional systematic study	Generate and test hypothesis
10	Write report and recommendations (consider publication)	Collect specimens (e.g., culture of environment or personnel based on data)	Analyze data and interpret results/
11	Debrief the team	Implement and evaluate control and preventive measures	Refine case definition and hypothesis as necessary/
12	Develop long term control and prevention measures	Initiate surveillance	Evaluate overall investigation and response
13		Communicate findings; summarize investigation for requesting authority; prepare written report	Write report and recommendations
14			Define objectives for further research, if applicable
15			Debrief team

	Skills Enhancement for Public Health – Outbreak Module	APIC 2nd edition – required reading	DCM - NL
16			Implement or enhance long-term prevention and control measures

Describing the Outbreak

An outbreak can often be described in a way that includes the person, place and time:

- Who got sick
- Where are they (ward, unit, floor etc) and
- When did they get sick

Person: patient/resident/client exhibiting illness

- Do they have common issues (e.g. age, sex underlying condition)
- Are they connected in some way (exposure to same staff/physician)
- Have they undergone similar procedures

Place: population at risk (service, ward, unit etc.)

- Is the illness confined to one specific area or is spread throughout the facility
- Are there patients who may be at higher risk (e.g., unimmunized for influenza)

Time: period of the outbreak

- Date of onset for the first case
- Time since exposure

A “**common source**” outbreak occurs from exposure to a pathogen in a source such as a food item, water, or a piece of equipment. This can result from a single exposure to the agent or from repeated exposures. They are usually characterized by explosiveness of onset and limitation or localization in time, place and people. A typical example of this is a single source of exposure such as a pathogen from a food item. If a large number of people get ill within a very short time period one should consider a “common source” such as food, water or a piece of equipment.

A “**propagated outbreak**” occurs when there is serial transfer from person to person. These situations may begin as a few cases and each day a few more cases occur as the first cases recover. This is usually caused by someone’s bringing the infectious agent into the facility making one or two people ill, who in turn infect others, and so on.

Questions that should be considered are:

- Who were the first individuals to become ill
- Was there an activity or an outing that they have in common
- Are they or where they located in the same place (could be unit, site, area)
- Was there any object that they shared (food, equipment)

Case Definition

It is important to have a clear definition of what collection of symptoms constitutes a case and how many cases constitute an outbreak. For some illnesses such as gastrointestinal infections (GI) and respiratory infections there will be a pre-determined case and outbreak definition that has been developed by the provincial Public Health.

For example in British Columbia the case definition for an infectious GI illness is:

A case of probable GI infection is defined as any one of the flowing conditions that cannot be attributed to another cause (e.g.: laxative use, medication side effect, diet, prior medical condition):

- *Two or more episodes of diarrhea in a 24 hour period – above what is considered normal for that individual OR*
- *Two or more episodes of vomiting in a 24 hours period OR*
- *One episode each of vomiting and diarrhea in a 24 hours period OR*
- *Positive culture for a known enteric pathogen with a symptom of GI infection (e.g. vomiting, abdominal pain, diarrhea) OR*
- *One episode of bloody diarrhea.*

And the accepted definition of a GI Outbreak is:

- *Three or more cases of GI infection (as defined above), potentially related, occurring within a four day period, within a specific geographic area (i.e. unit, ward).*

Regardless of whether it is a pre-determined case definition or one you are creating in the moment, a case definition should be narrow enough to focus any investigations but broad enough to ensure all potential cases are included.

Do you have pre-determined case and outbreak definitions? Where can you find this information? Case Definitions for Communicable Diseases under National Surveillance are available at:

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09pdf/35s2-eng.pdf>

Line List

A simple line listing (example in Appendix C) can help you organize all your information so that it will be easier to try to formulate a theory on what has caused this. Once you have all the information collected consult with your Medical Officer of Health, Infection Control Officer, or a senior Infection Prevention and Control Professional to help you formulate your theory or hypotheses.

- Does your site have a template line listing form?
- Where would you find it?
- Who would you consult with to assist you in determining a case definition and if an outbreak exists?

Problem Solving When Control Measures appear to be failing

It is expected that after a few days of outbreak control measures, the number of new cases should diminish. If new cases continue to appear four to five days after outbreak control measures have been implemented the following factors should be explored and reviewed with the MHO and Outbreak Management Team:

- Are there any lapses in hand-washing/hand sanitizing?
- Are all hand hygiene stations well stocked with soap or alcohol-based hand sanitizer, and are new refills of products easily to locate by all staff, volunteers and visitors?
- Is the appropriate personal protective equipment available and being appropriately worn by staff members
- Is personal protective equipment being changed between providing care to sick residents/residents and those that are well?
- Is any equipment being used for sick and well residents/residents without being cleaned and disinfected between uses?
- If respiratory in nature: has anyone with a cough been moving around the facility without a mask, and/or without performing appropriate hand hygiene?
- If influenza is involved in the outbreak and the above do not explain ongoing illness:
- Are all residents immunized against influenza and taking antiviral medication, if appropriate?
- Are all staff members, including physicians and volunteers, either immunized against influenza or have they taken an antiviral medication?
- Have residents/staff taking antiviral medication been appropriately screened for symptoms to ensure the proper treatment versus prophylactic dose of antiviral is being used; under-dosing may lead to the emergence of antiviral resistant strains
- Have more recent outbreak specimens been screened for the possible emergence of antiviral resistance mutations in the virus?

Declaring the Outbreak Over

Who is responsible for declaring an outbreak over? Are there defined criteria for declaring an outbreak over?

Type of Outbreak	Person Responsible	Criteria needed
Gastrointestinal Outbreak		
Respiratory Outbreak		
Exposure to a piece of equipment or instrument		
MRSA Outbreak		

Debriefing the Team

As the ICP on the outbreak team, identify your role in the debriefing of the team. The aim of the debriefing process is to answer the following three questions:

- How well prepared were we?
- How well did we do?
- What worked and what didn't?
- What can we do better in future?

Debriefings are about improving performance and should not be used as a method of apportioning blame for any failings identified.

Formal debriefs should look to identify both strengths and weaknesses and to turn these into recommendations for enhancing performance. Examples of opportunities for improvement are:

- Communication within OMT and to media
- Timeliness in recognizing and reporting outbreak
- Timeliness in implementing control measures
- Effectiveness of control measures in limiting the outbreak

Goals of the Discussion

- Reviewing all that happened in the event to create a complete and coherent picture, including all of the treatments given to the casualties by the team.
- Analysis of the team's functioning in the event, concluding whether there are necessary changes to be made and the method of their implementation.

Stages of the Debriefing

1. Opening: 5 to 10 minutes (less, if this is not the first discussion, but one must never skip this stage).
2. Discussion phase: 20 to 30 minutes, depending on the number of participants, the complexity of the event, and the previous relationships of the team members.
3. Gathering of strength and summing-up stage: 20 to 25 minutes.

Outbreak Summary Report (sample – Appendix C)

The purpose of an outbreak summary report may be to

- Summarize facts of outbreak
- Substantiate recommendations
- Share new insights
- Prevent future outbreaks
- Assist in investigation and control of similar incidents
- Provide a document for potential legal issues

The time immediately following an outbreak may be the best time to communicate the findings of your investigation. At this time, the outbreak experience will be fresh in the minds of the key stakeholders, making it more likely they will become engaged in actions based on your recommendations. There are steps associated with this report and they must include:

- Introduction and Background
- Purpose and Objectives
- Methods of Investigation
- Results or Key Findings
- Discussion (the interpretation of the findings)
- Recommendations based on the evidence your report and on rationale or support from the literature

The report does not have to be lengthy, usually about 2-6 pages in length. Recommendations reflect what you/team think should be done to prevent the occurrence of other outbreaks.

Additionally, in some provinces there is an external database, usually on a Public Health website for the entry of data. There will also be a report needed for internal communication. Does your province have a Public Health database? Do you have a template for outbreak summary at your facility?

Develop long term control and prevention measures

Use the information from the outbreak report and debrief session to develop long term control and prevention measures for outbreaks at your facility. It might be as simple as having pre-packaged specimen collection kits for each unit (includes requisitions).

Appendix B**Case Study – Respiratory Illness**

You are an ICP whose office is in an acute care site but who also provides support to the nearby LTC facility. This morning (November 10th) you receive a call from the Director of Care from the LTC site:

She tells you that on November 7th they had 3 residents with varying degrees of fever and productive cough and on November 8th they had 4 more residents with similar symptoms. Two of the residents had fever of 102 F and one of them was hospitalized this morning with pneumonia. The hospitalized patient also has a history COPD. No ill residents are in the assisted living unit. In the past week she has had 2 staff members call in sick with respiratory symptoms.

Work through this study with your mentor, answering the following questions and using them to stimulate conversation around control methods, communication to patients, staff and public, education to patient's staff and public and the roles and responsibilities of the various people at your site.

You are the ICP that is notified of this situation. Let's assume that your office is at this facility. Given what you have just learned:		
Step 1 Determine if an outbreak exists	<ul style="list-style-type: none"> • What is the first thing you should do? 	
	<ul style="list-style-type: none"> • Who would be sources of information about the cases? 	
	<ul style="list-style-type: none"> • How would you rule out alternative causes? 	
	<ul style="list-style-type: none"> • Consider the possible diagnosis and think of the possible causes, the incubation periods and the typical signs and symptoms. 	
	<ul style="list-style-type: none"> • Can you use the chain of infection to help identify the cause of this event? 	
	<ul style="list-style-type: none"> • What specimens would you send (if any)? 	
	<ul style="list-style-type: none"> • What information would you collect on the line list? 	
	<ul style="list-style-type: none"> • What would you tell staff about monitoring their own health? 	
	<ul style="list-style-type: none"> • What would you advise staff regarding working on other units/facilities? 	
	<ul style="list-style-type: none"> • Any other things you would suggest? 	
	<ul style="list-style-type: none"> • Look at your surveillance data and see if this is normal trend for this unit? Would you expect 	

	this number of cases on this Unit?	
	<ul style="list-style-type: none"> • How would you determine if the client was vaccinated? 	
	<ul style="list-style-type: none"> • How would determine if the staff were vaccinated? 	
	<ul style="list-style-type: none"> • If this is influenza, is there a recommendation for staff who have not been vaccinated? Can they work? 	

Step 2 Implement immediate control measures	<ul style="list-style-type: none"> • What infection control measures would you recommend? 	
	<ul style="list-style-type: none"> • Is the signage available? 	
	<ul style="list-style-type: none"> • Is there a fact sheet about Respiratory infections? 	
	<ul style="list-style-type: none"> • Where would you get extra facial protection materials, gowns and gloves for this situation? 	
	<ul style="list-style-type: none"> • Who will notify the patient, family and others of the event? 	
	<ul style="list-style-type: none"> • Who will notify the Medical Officer of Health (MOH)? When will you notify the MOH? 	
	<ul style="list-style-type: none"> • How will you determine if there is a need for education sessions relating to this outbreak? 	

Step 3 Establish a working diagnosis	What would you consider the case definition?	
	How long does it take to get the results of the tests that you requested?	

Step 4 Assemble the team	Does your facility have an outbreak management team?	
	Who should be on this team?	
	What would be the responsibility of the communications expert?	
	Who needs to know about this outbreak?	
	When will you close the ward/facility to visitors/admissions?	
	How often should you meet?	
	Is there a sample agenda ready for outbreaks?	
	Explore with your mentor the process for assembling a team if the outbreak occurs on a weekend.	

Step 5 Ongoing monitoring communication	Who is at risk of becoming ill on the Unit?	
	Are you responsible for analyzing and interpreting the data?	
	Evaluate the overall investigation and response; is there anything else you should do now?	
	Who else might you be communicating with as the outbreak continues? (external & internal)	
	How do you communicate to other employees, the community and family members re this outbreak?	
	Is there legislation in your province regarding the reporting of outbreaks?	

Step 6 Declaring the outbreak over	What criteria could be used to indicate that the outbreak is over?	
	Who can declare the outbreak over in your facility?	

Step 7 Debriefing the staff	Who is responsible for doing this at your facility?	
	How will you do this?	
	Do you have an outline of activities to discuss?	

Step 8 Writing the report and recommendations	Why write a report?	
	What are the key elements of a report?	
	Why is important to include a recommendations sections?	
	Who should get the report?	

Appendix C

Sample of line listing

Patient/Resident/Client Information					Clinical Presentation			Specimen(s) sent	
Name	Date of birth y/m/d	Unit	Room #	Room type	Date of onset of symptoms	Symptoms	Duration of symptoms	Collection Date/ Date Submitted	Result

SYMPTOMS: V=Vomiting D=Diarrhea C=Cramps N=Nausea F=Fever H=Headache A=Abdominal Pain M=Myalgia
 Co =Cough ST=sore throat ROOM TYPE: P=Private S=Semi-private M=Multi-bed

Outbreak Summary Report (example)

Date of onset of outbreak: _____ Date outbreak declared over: _____

Microorganism identified: _____ Laboratory Confirmed? Yes No

Number of specimens identified in: _____ Suspected source: _____

Number of patients exposed: _____ Total number of cases (patients): _____

Attack rate for patients (# of cases, divided by # exposed, multiply by 100): _____

Number of HCWs exposed: _____ Total number of cases (HCWs): _____

Attack rate for HCWs (# of cases, divided by # exposed, multiply by 100): _____

Number of cases requiring higher level of care: _____
(E.g. transfer to hospital, transfer to ICU)

Number of deaths: _____

Unusual situations:

Updated: July 30, 2012

Appendix D



Notifiable Disease List Report to your Regional Medical Officer of Health

Revised 28-Mar-11

List A <i>Immediate, detailed reporting of suspect and confirmed cases (same day)</i>	List B <i>Routine, detailed reporting (weekly); Immediate reporting if outbreak is suspected or confirmed (same day)</i>	List C <i>Routine, aggregate reporting (weekly)</i>
<ul style="list-style-type: none"> • Acute Flaccid Paralysis (AFP) • Anthrax • Botulism • Cholera • Creutzfeldt-Jakob Disease (CJD) • Diphtheria • Hepatitis A • Influenza Virus of a Novel Strain • Invasive Group A Streptococcal Disease • Invasive <i>Haemophilus influenzae</i> non-B • Invasive <i>Haemophilus influenzae</i> type B (Hib) • Invasive Meningococcal Disease (IMD) • Legionellosis • Listeriosis • Measles • Meningitis, Bacterial (other than IH, IMD or IPD) • Mumps • Paralytic Shellfish Poisoning • Plague • Poliomyelitis • Rabies • Rubella • Severe Respiratory Illness, unknown origin • Smallpox • Tuberculosis • Typhoid/Paratyphoid Fever • Verotoxigenic <i>Escherichia coli</i> • Viral Hemorrhagic Fevers (Crimean Congo, Dengue, Ebola, Lassa, Marburg, Rift Valley) • West Nile Virus Infection 	<ul style="list-style-type: none"> • Amoebiasis • Brucellosis • Campylobacteriosis • Chancroid • Chickenpox • Chlamydia • Congenital Rubella Syndrome • Cryptosporidiosis • Cyclosporiasis • Cytomegalovirus Infection • Dengue Virus Infection • Epidemic Encephalitis • Food-borne Epidemic/Outbreak • Giardiasis • Gonorrhea • Group B Streptococcal Disease of Newborn • Hantavirus Pulmonary Syndrome • Hepatitis B • Hepatitis C • HIV Infection • Influenza, Laboratory Confirmed • Invasive Pneumococcal Disease (IPD) • Leprosy • Lyme Disease • Lymphogranuloma venereum • Malaria • Meningitis, Viral • Nontuberculosis Mycobacterial Disease • Norovirus Infection • Ornithosis/Psittacosis • Pertussis • Q Fever • Salmonellosis • Shigellosis • Syphilis, All Categories • Tetanus • Toxoplasmosis • Trichinellosis • Tularemia • Typhus • Water-borne Epidemic/Outbreak • Yellow Fever • Yersiniosis 	<ul style="list-style-type: none"> • <i>Clostridium difficile</i>-associated diarrhea • Coxsackievirus Infection (Hand, Foot & Mouth Disease) • Erythema Infectiosum (Fifth Disease) • Influenza-Like Illness (ILI) • Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA) • <i>Mycoplasma pneumoniae</i> Infection • Respiratory Syncytial Virus (RSV) • Rotavirus Infection • Vancomycin Resistant Enterococcus (VRE)

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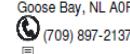
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Communicable Diseases

Objectives

At the completion of a 4-6 week orientation period the ICP will:

1. Identify communicable disease which are on the national and provincial notifiable diseases list
2. Describe the surveillance activities required to identify notifiable communicable diseases
3. Demonstrate a knowledge of the reporting process for notifiable diseases
4. Identify key contacts for public health
5. Determine the process for contact tracing for notifiable communicable diseases
6. Determine the role of IPAC in immunization delivery in your facility
7. Demonstrate a knowledge of the national surveillance system for influenza

Number of hours

- Readings – 1
- Activities – 2

Required Readings

- Heymann, D (2008) Control of Communicable Diseases Manual – 19th Edition
- Provincial Disease Control Manual
http://www.health.gov.nl.ca/health/publichealth/cdc/health_pro_info.html#disease

Other Suggested Readings

- Immunization Manual – NL web site
http://www.health.gov.nl.ca/health/publichealth/cdc/immunization_manual.pdf
- Guideline for Meningococcal Disease Management
http://www.health.gov.nl.ca/health/publichealth/cdc/meningococcal_management.pdf
- Guideline for invasive group A Streptococcus management
http://www.health.gov.nl.ca/health/publichealth/cdc/invasive_groupa_streptococcal_management.pdf
- FluWatch - <http://origin.phac-aspc.gc.ca/fluwatch/>

Instructions

Read the material. Write out your answers to the questions and discuss them with your mentor. It is recommended that a one hour session with a Communicable Disease Control Nurse (CDCN) be included in the orientation period.

I. Overview

Infection Prevention and Control staff and Public Health staff have a number of intersecting roles within the hospital and the community. The first contact with a communicable disease such as tuberculosis may be in the hospital but the contact tracing and follow-up is done in the community. The timely reporting to public health allows for prompt identification of contacts and appropriate follow-up. Communicable diseases (CDs) are made notifiable in the provinces and territories of Canada by provincial and territorial statute. The purpose of

making a specific communicable disease reportable is to facilitate both tracking and the required control efforts by public health personnel. The Public Health Agency of Canada's Nationally Notifiable Disease (NND) list can be viewed at

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/06pdf/cdr3219.pdf>

The case definitions for communicable diseases under national surveillance can be viewed at:

<http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/09pdf/35s2-eng.pdf>

The Newfoundland Labrador Notifiable Disease List (Appendix A) can be viewed at:

<http://www.health.gov.nl.ca/health/publichealth/cdc/listabc20.pdf>

II. Key Concepts

i. Definitions

Refresh your memory on these key terms that are used frequently in the public health arena.

(a) Key terms

Chain of infection	
Reservoir	
Occurrence	
Mode of transmission	
Incubation period	
Period of communicability	
Susceptibility	

ii. Differentiate between a communicable and notifiable disease

What is a communicable disease?
What is a notifiable disease?
Go to the PHAC website (address above) and determine if <i>Clostridium difficile</i> is a national notifiable disease.
Go to the Notifiable Disease List for your province and determine if Methicillin-resistant <i>Staphylococcus aureus</i> is on that list.
In NL, differentiate between List A, B & C

iii. Surveillance

How will you find out about any notifiable communicable diseases in your facility?

iv. Reporting

How are notifiable communicable diseases reported in your facility?	
Responsibility	To Whom
Micro Lab	
Public Health Lab	
IPAC	
Other	

v. Follow-up

Who is defined as a contact?	
What is contact tracing?	
Who is responsible for contact tracing in your facility/Regional Health Authority?	
What does post-exposure mean?	

vi. Prevention

Immunization has been recognized as one of the most important contribution to the control of communicable diseases over the past several decades. The ICP collaborates frequently with Occupational Health and Public Health on issues involving the immunization of staff and patients. This requires knowledge of immunization recommendations.

Immunization Manual
Identify the web site or hard copy of the immunization policies for your province.
Book mark the site of the Canadian Immunization Guide as a favourite http://www.phac-aspc.gc.ca/publicat/cig-qci/index-eng.php
Why is it important for employees to have the hepatitis B vaccination?

III. Methods

i. Communicable Diseases on the Notifiable Disease List

Identify 4 diseases on the Notifiable Disease List for your province	
Disease	In NL is it on List A, B or C?

ii. Surveillance

You have been called by the Communications Department in your hospital to find out more about the case of meningococcal disease admitted during the night. You have no information on this case. How are you going to find out about this case?

Time to apply your knowledge!	
Your investigations reveal that there is a case of meningococcal disease in the ICU.	
Is this a notifiable disease?	
Why should you notify public health?	
Whom should you notify?	
Is there a policy in your facility regarding the follow-up for meningococcal disease?	

iii. Reporting

(a) Public Health Contacts

Notifiable communicable disease must be reported to public health officials as soon as they are identified. Discuss with your mentor the key public health officials in your area.

Key Public Health Staff		
	Name	Contact Information
Health Unit		
Regional Medical Officer of Health		
Communicable Disease Control Nurse		
Public Health Laboratory		
Other		

(b) Reporting requirements

What are the reporting requirements relating to meningococcal disease in your facility?

iv. Follow-up

(a) Contact tracing

The doctor in the Emergency Room intubated the patient without the use of personal protective equipment.	
Define a close contact of a meningococcal case?	
Is the doctor considered a close contact?	
Who is responsible for identifying close contacts of the case?	
Does the doctor require chemoprophylaxis?	
If the doctor is recommended to have the prophylaxis; who provides the medication?	
How is the close contacts list developed?	

(b) Post-exposure

You have been called to the Patient Care Unit where a nurse has had a needle stick injury. The nurse is very concerned about contracting hepatitis B, hepatitis C and HIV.

Does your institution have a policy for post exposure prophylaxis for needle stick injuries?	
Who does the follow-up for this exposure in your facility?	
What is the policy for hepatitis B vaccination for staff?	
What is the post exposure follow-up for hepatitis B?	
What is the follow-up required for possible exposure to HIV and hepatitis C?	
Where can the employee access the post-exposure drugs for HIV?	

v. Prevention

Identify the role of IPAC in relation to pneumococcal immunization in your facility.
Identify the role of IPAC in relation to influenza immunization for patients/residents in your facility.

IV. Documentation & Reporting

Is there a requirement for documentation of your referrals to Public Health?	

V. Other Issues

FluWatch

FluWatch is Canada's national surveillance system that monitors the spread of flu and flu-like illnesses on an on-going basis. *FluWatch* reports, posted every Friday, contain specific information for health professionals on flu viruses circulating in Canada. Additional information can be found at: <http://www.phac-aspc.gc.ca/fluwatch/> Discuss with your mentor your facilities responsibilities for FluWatch reporting.

What is the FluWatch definition for influenza like illness for the 2010-2011 season?	
What is the hospitals and residential institutions definition?	
Do you have any responsibilities for reporting to FluWatch for your facility?	

Ethical Issues

Is there any privacy issues regarding the reporting of communicable diseases such as HIV in your facility?

Appendix A



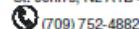
Notifiable Disease List Report to your Regional Medical Officer of Health

Revised 8-Apr-10

List A	List B	List C
<p>Immediate, detailed reporting of suspect and confirmed cases (same day)</p> <ul style="list-style-type: none"> - Acute Flaccid Paralysis (AFP) - Anthrax - Botulism - Cholera - Creutzfeldt-Jakob Disease (CJD) - Diphtheria - Hepatitis A - Influenza Virus of a Novel Strain - Invasive Group A Streptococcal Disease - Invasive <i>Haemophilus influenzae</i> type B (Hib) - Invasive Meningococcal Disease (IMD) - Legionellosis - Listeriosis - Measles - Meningitis, Bacterial (other than Hib, IMD or IPD) - Mumps - Paralytic Shellfish Poisoning - Plague - Poliomyelitis - Rabies - Rubella - Severe Respiratory Illness, unknown origin - Smallpox - Tuberculosis - Typhoid/Paratyphoid Fever - Verotoxigenic <i>Escherichia coli</i> - Viral Hemorrhagic Fevers (Crimean Congo, Dengue, Ebola, Lassa, Marburg, Rift Valley) - West Nile Virus Infection 	<p>Routine, detailed reporting (weekly); Immediate reporting if outbreak is suspected or confirmed (same day)</p> <ul style="list-style-type: none"> - Amoebiasis - Brucellosis - Campylobacteriosis - Chancroid - Chickenpox - Chlamydia - Congenital Rubella Syndrome - Cryptosporidiosis - Cyclosporiasis - Cytomegalovirus Infection - Dengue Virus Infection - Epidemic Encephalitis - Food-borne Epidemic/Outbreak - Giardiasis - Gonorrhea - Group B Streptococcal Disease of Newborn - Hantavirus Pulmonary Syndrome - Hepatitis B - Hepatitis C - HIV Infection - Influenza, Laboratory Confirmed - Invasive Pneumococcal Disease (IPD) - Leprosy - Lyme Disease - Lymphogranuloma venereum - Malaria - Meningitis, Viral - Nontuberculous Mycobacterial Disease - Norovirus Infection - Ornithosis/Psittacosis - Pertussis - Q Fever - Salmonellosis - Shigellosis - Syphilis, All Categories - Tetanus - Toxoplasmosis - Trichinellosis - Tularemia - Typhus - Water-borne Epidemic/Outbreak - Yellow Fever - Yersiniosis 	<p>Routine, aggregate reporting (weekly)</p> <ul style="list-style-type: none"> - <i>Clostridium difficile</i>-associated diarrhea - Coxsackievirus Infection (Hand, Foot & Mouth Disease) - Erythema Infectiosum (Fifth Disease) - Influenza-Like Illness (ILI) - Methicillin Resistant <i>Staphylococcus aureus</i> (MRSA) - <i>Mycoplasma pneumoniae</i> Infection - Respiratory Syncytial Virus (RSV) - Rotavirus Infection - Vancomycin Resistant Enterococcus (VRE)

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Occupational Health Module

Objectives

At the completion of a 4-6 week orientation period the ICP will:

1. Demonstrate a knowledge of the Occupational Health program within the facility
2. Describe the screening process for infectious diseases of healthcare workers on hiring
3. Identify the post exposure policy for infectious diseases including blood borne pathogens and occurrence reporting
4. Determine the process for staff contact tracing following contact with an infectious disease.
5. Demonstrate a knowledge of the Respiratory Protection Program
6. Determine the IC involvement with the Influenza Immunization Program
7. Display knowledge of work restrictions in the workplace
8. Identify at least five education sessions HCW should attend in order to protect themselves against occupational hazards

Number of hours

- Readings – 2 hours
- Activities – 1 hour

Required Text

- APIC Text: 3rd Edition, Chapter 26 - Occupational Health, Chapter 27 - Occupational Exposure to Bloodborne Pathogens, Chapter 107 -Immunization in the Healthcare Worker, Chapter 109- The Pregnant Healthcare Worker or
- Bennett JV and Brachman PS. Bennett and Brachman's Hospital Infections. 5th Edition William R Jarvis: Philadelphia; Pages 48, 68, 168 and 171
- Heymann DL (ed.). Control of Communicable Diseases Manual, 19th ed. Washington, DC: American Public Health Association; 2008

Other Readings

1. Routine Practices and Additional Precautions at:
http://www.health.gov.nl.ca/health/publichealth/cdc/routine_practices_additional_precautions.pdf
2. Review the education modules on Chain of Infection, Point of Care Risk Assessment, Routine Practices & Additional Precautions at:
<http://www.health.gov.nl.ca/health/publichealth/cdc/infectionpreventionandcontrol.html>
3. Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care – Revision of Isolation and Precautions Techniques PHAC (1999).
<http://www.collectionscanada.gc.ca/webarchives/20071116015234/http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/25s4/index.html>

4. Ontario Ministry of Health and Long-Term Care/Public Health Division/Provincial Infectious Diseases Advisory Committee (PIDAC)- Best Practices for Hand Hygiene in all Health Care Settings. Routine Practices and Additional Precautions in all Health Care Settings (May 2010) at
http://www.health.gov.on.ca/english/providers/program/infectious/diseases/best_prac/bp_routine.pdf

Other Resources

1. Public Health Agency of Canada (formerly Health Canada). Infection control guidelines for the prevention and control of occupational infections in health care. Can Commun Dis Rep 2002;28S1:1-264 <http://dsp-psd.pwgsc.gc.ca/Collection/H12-21-3-28-1E.pdf>
2. Public Health Agency of Canada (formerly Health Canada). Infection control guideline for preventing the transmission of bloodborne pathogens in health care and public services settings. Can Commun Dis Rep 1997(suppl);23S3:1-43 <http://www.phac-aspc.gc.ca/id-mi/index-eng.php>
3. Immunization Manual – NL web site
http://www.health.gov.nl.ca/health/publichealth/cdc/immunization_manual.pdf
4. Guideline for Meningococcal Disease Management
http://www.health.gov.nl.ca/health/publichealth/cdc/meningococcal_management.pdf
5. Guideline for Tuberculosis Management
http://www.health.gov.nl.ca/health/publichealth/cdc/tuberculosis_management_october2010.pdf
6. Canada Communicable Disease Report (CCDR-OH), Prevention and Control of Occupational Infections in Canada:
<http://dsp-psd.pwgsc.gc.ca/Collection/H12-21-3-28-1E.pdf>

Instructions

Read the material. Write out your answers to the questions and discuss them with your mentor. The ICP has a role to play in the preventing and control of infectious diseases in the healthcare worker (HCW). This includes disease transmission from the HCW to the patient and also from the patient to the HCW.

I. Overview

The infection prevention considerations when implementing an occupational health program is to provide a safe environment for patients/residents/clients and healthcare personnel. Recommended practices need to be based on how infections are transmitted in a healthcare facility and should address minimizing the worker as a potential source or host.

II. Key Concepts

The elements of an Occupational Health (OH) Program include surveillance, education, immunization, injury prevention, work restriction and the prevention of the transmission of infection. To address these elements a knowledge of certain key concepts are required and include pre-employment screening, post exposure follow-up, contact tracing, respiratory protection program, influenza immunization program, and work restrictions. In certain sections you will be asked to address the responsibilities assigned to the Occupational Health Program versus the responsibilities for the Infection Prevention and Control Program. If you determine that the ICP has no responsibility for this activity just indicate not applicable (NA).

i. Occupational Health Program

Office Location of OHS & Rehabilitation	
Name	Contact Information
Is there an Occupational Health Program in the facility?	
Who is in Employee Wellness nurse?	
Who is the Occupational Health and Safety Officer?	
Who is the Communicable Disease Control Nurse?	

ii. Pre-employment Screening for Communicable Diseases

Screening program – Identify the process for screening for the following communicable diseases.			
Diseases	OH pre-employment screening	Action ICP	Action of OHS
Measles			
Varicella			
Tuberculosis (TB)			
Hepatitis B			
Tetanus			
If the ICP is responsible for the screening indicate where you would find previous immunization records.			

iii. Post-exposure interventions:

	Action of ICP	Action of OHS
What does post-exposure mean in relation to bloodborne pathogens?		
What is the importance of post exposure follow up in Infection Control?		
What policies would you need to review in order to counsel the HCW who sustains a needlestick injury?		

iv. Contact tracing

	Action of ICP	Action of OHS
What does contact tracing mean?		
Who is considered a contact? For example in a case of infectious respiratory TB?		
Is there a criterion for determining if a significant exposure to TB has occurred?		
If it was determined that an infectious case of TB was on a Patient Care Unit, who would be involved in determining the exposure and follow up required?		
Who does contact tracing for the patient?		
Who does the contact tracing for the HCW?		
Who does the contact tracing for the family?		

v. Respiratory Protection Program

Respiratory Protection Program	
What is a Respiratory Protection Program?	
Why is the existence of a Respiratory Protection Program important to IPAC?	

Respiratory Protection Program			
Is there a Respiratory Protection Program available for HCWs in your facility?		Location: Contact information:	
Do you know the different types of respirators/masks and indications for use. Give an example of each.		Mask	Respirator
Are you fit tested? If yes, indicate your respirator type. If no, you will need to get fit tested.		Type of respirator:	

vi. Influenza Immunization Program

Determine the components of the program		
What is an influenza immunization program?		
Why is it important to have this program in your facility?		
Why is it important for the ICP to be involved?		
	Action of ICP	Action of OHS
If there is an influenza immunization program, describe the involvement of ICPs & OH as it relates to HCWs and to patients/clients/residents.		
When does planning for the annual influenza program start?		

vii. Work Restrictions

Define work restrictions?		
Determine if your facility has HCW work restriction for the following conditions?		
	Action of ICP	Action of OHS
• Diarrhea of unknown etiology		
• Influenza		
• Herpes simplex		
• Conjunctivitis		

viii. Education

Education	Action of ICP	Action of OHS
Determine if there are educational sessions for HCWs for the following topics.		
• Personal Protective Equipment		
•		
• RPAP and PCRA		
•		
• Safety Sharps Program		
•		
• Workplace Safe Practices		
•		
• Waste Management		
•		
• Enhancing HCW acceptance and availability of vaccines		
• Managing HCW with dermatitis and those who are immunocompromised		

III. Methods

Discuss with your mentor and review specific policies for your healthcare facility.

Scenario 1 A		
A new case of tuberculosis (TB) was just diagnosed in a patient. This patient has been in a four bed ward for five days.		
Questions	Action of ICP	Action of OHS
What should the nurse do once the isolation precautions are initiated?		
What would be the first steps the ICP would take when notified of this case?		
What is the role of the ICP in contact tracing for this scenario?		
Who initiates staff follow-up?		
What pre-employment screening endeavour will be important at this time?		
Who initiates family community follow-up?		
What aspect of the Respiratory Protection Program is important at this time?		
How do you determine if the HCWs have received appropriate education on the type of PPE and type of isolation necessary required for this patient?		

Scenario 1B		
An Environmental Service worker is about to enter an Airborne Precaution room. (This patient has been diagnosed with TB). The worker is putting on PPE. You are auditing the practices of the worker.		
Questions	Actions of ICP	Actions of OHS
When should hand hygiene be performed?		
What PPE must be worn?		
If the HCW applies a mask, what would you do?		
If the HCW applies a respirator, how would you determine if the HCW did a fit check?		
How will you know that the room is an airborne isolation room?		

Scenario 2		
An Environmental Service worker is stripping a bed and is pricked with a sharp. Assess the situation to see what needs to be carried out.		
Questions	Actions of ICP	Actions of OHS
What should the healthcare person do first?		
Healthcare personnel who come in contact with and body fluids should be vaccinated against?		
To whom do you report the incident?		
What type of follow up post exposure?		
How do we practice sharp safety?		

Scenario 3		
A nurse who is working on the medicine floor has onset of a high fever, chills, and aches and pains all over.		
Questions	Actions of ICP	Actions of OHS
What should the nurse do?		
Whom should they notify?		
Is there any contact tracing required on this Unit?		
Is there any post-exposure follow-up required on this Unit?		
How would you determine the influenza immunization update of other HCWs on this Unit?		
Should the nurse have a nasopharyngeal swab done? Who does it?		
What are the work restrictions relating to influenza like illness?		
Is there follow-up with the family physician required?		

Scenario 4		
While working a nurse experiences severe cramping and had three bouts of explosive diarrhea and one bout of vomiting.		
Questions	Actions of ICP	Actions of OHS
What should the nurse do?		
Whom should the nurse inform?		
Is there any contact tracing required on this Unit?		
Is there any post-exposure follow-up required on this Unit? Consider the bathroom used by the nurse...		
Is it necessary to collect a stool sample from the nurse and who does this? What type of samples would you recommend?		
What are the work restrictions required for gastrointestinal illness?		

Scenario 5		
A nurse on a medicine unit has just confirmed scabies on a patient who has been an inpatient for a week.		
Questions	Actions of ICP	Actions of OHS
What should the nurse do first?		
What isolation precautions should be initiated? When can the isolation precautions be discontinued?		
Who would be considered as having significant exposure?		
How would you determine contact tracing? Who would you do contact tracing on?		
Who should be informed?		
What work restrictions apply to the nurse?		

Scenario 6		
A nurse splashes her eye during the suctioning of a patient in ICU.		
Questions	Actions of ICP	Actions of OHS
What do you do if you get a significant exposure?		
Who should be informed about the incident?		
What type of PPE should be used during suctioning?		
If appropriate PPE was not used what can you do to ensure that this does not happen again?		

IV. Documentation and Reporting

(i) Policy

- Determine if there is a policy which describes the reporting protocol for infectious diseases which require contact tracing such as for the case of HCWs who have occupational exposure to TB.

(ii) Documentation

- Determine if the ICP has a responsibility to document the actions taken if consulted on an occupational exposure.

Construction Renovation Module

Objectives

At the completion of a 4-6 week orientation period the ICP will understand the role of the ICP in the planning and operation stages of construction and renovation projects, the risks to all occupants in health care facilities including patients, visitors and staff during construction and renovation and the infection prevention and control measures required in order to prevent the spread of infectious diseases.

The ICP will:

1. Identify the organisms which can cause health risks during construction/renovation
2. Describe the infection preventive and control measures required during construction/renovation in a healthcare facility
3. Review a construction project in the facility and identify the role of IPAC during the construction/renovation

Number of hours

- Readings – 3 hours
- Activities – 3 hours

Required readings

- APIC Text: Chapter 108 (2nd Ed.). APIC Text: Chapter 106 (3rd Ed.)
- CSA Standard Z317.13-07 Infection control during construction, renovation, and maintenance of health care facilities (2007)
- CSA Z8000-11. (2011). Canadian Healthcare Facilities (sections are recommended by mentor).

Additional resources

- CHICA-Canada's construction-related Infection resources
http://www.chica.org/links_construction.html
- PowerPoint presentations on CHICA website from 2007 conference
http://www.chica.org/Members/conf_presentations07.html

Instructions

Read the material, view the PowerPoint presentations and do the practice exercises. Write out your answers to the questions and discuss them with your mentor.

I. Overview

Dispersal of microorganisms during construction and renovation has been reported to cause significant morbidity and mortality for vulnerable patient populations. Input from IPAC will ensure that efforts to reduce infectious risks to the patients have been followed.

The main areas for the involvement of infection prevention and control (IPAC) during the construction/renovation within healthcare facilities include:

- (i) Providing IPAC consultation during all phases of construction/renovations

- (ii) Monitoring of infection control precautions during and immediately following any construction/renovations
- (iii) Reporting of any breaches of IPAC precautions to the Project Leader

II. Key Concepts

This is basic information which the ICP will require before becoming involved in the construction/renovation for the facility.

i. Definitions

Key definitions – Explain what these are and how you can use them.	
Canadian Standard Association Z317.13	
Infection control risk assessment	
Preventative measures analysis form	
Identify your facility's policy and procedure for construction/renovation.	

ii. Infectious risks

Describe the role of dust, mold and water as infectious risks.	
Why worry about dust?	
Where is dust generated from during construction?	
What are the areas that can be associated with bacteria in the water?	
List some other water contaminants that can be found during construction and renovation.	

Describe the construction/renovation health risks associated with the following microorganisms.		
Microorganisms	Health risk created during construction	How can you reduce the risk?
Fungi – Aspergillus		
Bacteria - Legionella		

iii. Preventative measures analysis

Components of a preventative measures analysis		
Differentiate between population risk group 1, 2, 3, & 4	Risk Group 1	
	Risk Group 2	
	Risk Group 3	
	Risk Group 4	
Define construction activities Type A, B,C, D	Type A	
	Type B	
	Type C	
	Type D	
Give examples of differences between preventive measures Class1, Class 2, Class 3 and Class 4 used before construction	Preventative Measure 1	
	Preventative Measure 2	
	Preventative Measure 3	
	Preventative Measure 4	
Give examples of differences between preventive measures Class 1, Class 2, Class 3 and Class 4 during construction	Preventative Measure 1	
	Preventative Measure 2	
	Preventative Measure 3	
	Preventative Measure 4	

III. Methods

Learning objective: The ICP will apply the key concepts to a current construction/renovation project within the healthcare facility. Your mentor will arrange for a tour of a construction/renovation site.

Discuss with your mentor	
Does your facility have a construction/renovation committee or team?	
What members are included on the team?	
What are the roles and responsibilities of the ICP on the team?	
Identify key contacts for construction/renovation in your facility.	
At what class of construction does the ICP become involved?	

For the construction activity identified – After the “Class” of construction activity was identified list the infection prevention and control measures that were required to be followed at the site.

Using Appendix A complete a preventative measures analysis for your constructive activity. If you don't have a project at the present time using a population risk group of 3 and a construction activity of type C identify the infection control requirements

Project - Preventative measures analysis	Infection Control requirements

Education for construction/renovation staff	
Review your organization's education session for construction/renovation staff for this project. If one is not in place discuss with your mentor where you might get one.	
What would you include in your education to the construction renovation staff?	
Is there anyone else you would need to include in your education session besides the construction team?	
For this project has there been an evaluation of the education sessions been done?	

Design phase	What to look for?
Identify any issues that were identified by IPAC during the design phase of this project.	
Identify IPAC issues relating to the following design projects <ul style="list-style-type: none"> • Hand hygiene stations • Patient rooms • Flooring – factors to consider • Location of clean/dirty utility rooms • Locations of washrooms for patients, staff and public 	

Monitoring of the project – what to look for?	
PMA phase	
Education Phase	
Design Phase	
Construction Phase	

IV. Documentation and Reporting

The ICP should visit the construction site with the facility project manager to ensure that preventive measures are being adhered to and appropriate modifications are made if there are any on-site design changes.

For the construction project that you have identified :	
Is there a documentation process in place for visits made to the construction site	
Review documentation related to visits to the project.	

For the construction project that you have identified :	
How often were visits made? Who did the visits?	
Where there any recommendations for the project manager or IPAC as a result of the visits?	
If occurrences are not corrected, is there a reporting responsibility?	
What are the key components of the report?	
Was there an awareness of the Infection Control recommendations by the project staff and by the staff on the Unit affected by the construction (if applicable)?	

V. Other Issues

(i) Commissioning of the site

Following completion of the project identify the responsibilities of IPAC.

Appendix A

COMPLETION OF THE PREVENTATIVE MEASURES ANALYSIS

Step 1:

Using the following table, identify type of Construction Project Type (A-D)

Type A	<p>Inspection and Non-Invasive Activities Includes but not limited to:</p> <ul style="list-style-type: none"> a) Activities that require removal of no more than one ceiling tile or require wall or ceiling tiles to be opened. b) Painting (but not sanding), and wall covering c) Electrical trim work d) Minor plumbing work that disrupts water supply to a localized patient care area (i.e. 1 room) for less than 15 minutes; and e) Other maintenance activities that do not generate dust or require cutting of walls or access to ceilings other than for visual inspection.
Type B	<p>Small scale short duration activities which create minimal dust Includes but not limited to:</p> <ul style="list-style-type: none"> a) Activities that require access to chase spaces (i.e. where wire could be run or may include duct work) b) Where dust migration can be controlled, cutting of walls or ceilings for installing or repairing minor electrical work, ventilation components, telephone wires, or computer cables c) Sanding or repair of a small area of a wall; and <p>Plumbing work that disrupts the water supply of more than one patient care area (i.e., two or more rooms) for less than 30 minutes</p>
Type C	<p>Activities that generate a moderate to high level of dust; requires demolition; require removal of any fixed building components (e.g., sink) or assembly (e.g., countertops, cupboards); or cannot be completed in a single work shift. Includes but not limited to:</p> <ul style="list-style-type: none"> a) Activities that require sanding of a wall in preparation for painting or wall covering b) Removal of floor coverings, ceiling tiles, and casework c) New wall construction d) Minor ductwork e) Electrical work above ceilings f) Major cabling activities, and <p>Plumbing work that disrupts the water supply of more than one patient care area (i.e., two or more rooms) for more than 30 minutes but less than 1 hour.</p>
Type D	Activities that generate high levels of dust, and major demolition and construction activities requiring consecutive work shifts to complete.

	<p>Includes but not limited to:</p> <ul style="list-style-type: none"> a) Activities that involve heavy demolition or removal of a complete cabling system b) New construction that requires consecutive work shifts to complete; and <p>Plumbing work that disrupts the water supply of more than one patient care area (i.e., two or more rooms) for more than 1 hour.</p>
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Step 2:

Using the following table, identify the Patient Risk Group that will be affected. If more than one risk group will be affected, select the higher risk group.

Group 1 Lowest Risk	<ul style="list-style-type: none"> • Office areas • Public areas • Unoccupied wards • Laundry and soiled linen cleaning areas • Physical plant workshops and Housekeeping
Group 2 Medium Risk	<ul style="list-style-type: none"> • All other patient care areas unless stated in Group 3 or 4 • Outpatient clinics (except for oncology & surgery) • Admission and discharge units • Waiting rooms • Autopsy and morgue • Occupational and Physical therapy areas remote from patient care areas
Group 3 Medium to High Risk	<ul style="list-style-type: none"> • Emergency room (except trauma rooms) • Diagnostic Imaging • Birth Unit (non-operating room) • Nurseries for healthy newborns (i.e. Family Newborn Unit) • Nuclear Medicine • Hydrotherapy tank areas (in Physiotherapy) • Echocardiography • Laboratories • General medicine and surgical units (other than those listed in Group 4) • Paediatrics • Geriatrics • Food preparation, serving, dining areas • Respiratory therapy • Clean linen handling and storage areas
Group 4 Highest Risk	<ul style="list-style-type: none"> • All Intensive Care Areas (NICU & PICU) • All Operating Rooms (Birth Unit, Gyne, & Pediatrics), including prep, induction, post-anesthesia care unit (Recovery Room) and scrub areas. • Anaesthesia storage areas and workrooms • Oncology units and outpatient clinics for cancer patients (i.e. 6 North Inpatient and Ambulatory) • Transplant units and outpatient units for transplant patients (i.e. 6 North Inpatient and Ambulatory)

	<ul style="list-style-type: none"> Units and outpatient clinics for patients with AIDS or other immunodeficiency diseases (i.e. PMU and MDTAU) Dialysis units (6 North or 4th floor dialysis unit) Cardiac catheterization and angiography areas Endoscopy or Bronchoscopy areas Cystoscopy Pharmacy admixture rooms Central Sterile Processing Department or any sterile supply rooms Burn car units (5 South) Animal rooms Trauma rooms Protective environment isolation rooms Tissue culture laboratories Dental procedure rooms
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Step 3:

Match the Patient Risk Group (low, medium, medium-high, highest) with the planned Construction Project Type (A, B, C, D) to find the Class Precautions (I, II, III, IV) or level of infection control activities required.

Construction Activity				
Risk Group	Type A	Type B	Type C	Type D
Low	I	II	II	III/IV
Medium	I	II	III	IV
Medium-High	I	III	III/IV	IV
Highest	I-III	III/IV	III/IV	IV

For Highest risk group and all other shaded areas (Class III, III/IV, & IV) IPCS consult shall be completed. If unsure of the level of risk or if work to take place in a patient care area IPCS shall be contacted.

Step 4:**Using the following table identify the outlined precaution (Class I-IV) and Infection Control Requirements**

Class I	<p>Engineer/Maintenance Staff & Contractors</p> <p>1) Construction/Renovation Activities</p> <ul style="list-style-type: none"> • Dust Control <ul style="list-style-type: none"> • Immediately replace tiles displaced for visual inspection • Vacuum work area <p>2) Plumbing Activities</p> <ul style="list-style-type: none"> • Schedule water interruptions during low activity • Flush water lines prior to reuse • Observe for discolored water • Ensure water temperature meets the standards set by the health care facility • Ensure gaskets and items made of materials that support the growth of Legionella are not being used • Ensure faucet aerators are not installed or used • Maintain as dry an environment as possible and report any water leaks that occur to walls and substructures <p>Environmental Services</p> <p>1) Plumbing Activities</p> <ul style="list-style-type: none"> • Report discoloured water and water leaks to maintenance and IPAC <p>Medical/Nursing Staff</p> <p>1) Construction/Renovation Activities</p> <ul style="list-style-type: none"> • Risk Reduction <p>Minimize patients' exposure to construction/renovation area</p> <p>2) Plumbing Activities</p> <ul style="list-style-type: none"> • Report discoloured water and water leaks to maintenance and IPCS
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Class II	<p>Engineer/Maintenance Staff & Contractors</p> <p>1) Construction/Renovation Activities</p> <p>a) Dust Control</p> <ul style="list-style-type: none"> • Execute work by methods that minimize dust generation from construction or renovation activities • Wet mop and/or vacuum as necessary • Provide active means to minimize dust generation and migration into the atmosphere • Use drop sheets to control dust • Control dust by water misting work surfaces while cutting • Seal windows and unused doors with duct tape • Seal air vents in construction/renovation area • Place dust mat at entrance to and exit from work area <p>b) Ventilation</p> <ul style="list-style-type: none"> • Access the ventilation system in the construction/renovation
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	<ul style="list-style-type: none"> area to determine if it needs to be redirected Monitor need to change and/or clean filters in construction/renovation area <p>c) Debris Removal and Cleanup</p> <ul style="list-style-type: none"> Contain debris in covered containers or cover with a moistened sheet before transporting for disposal <p>2) <i>Plumbing Activities</i></p> <ul style="list-style-type: none"> Avoid collection tanks and long pipes that allow water to stagnate Consider hyperchlorinating or superheating stagnate water <p>Environmental Services</p> <p>1) <i>Construction/Renovation Activities</i></p> <p>a) Dust Control</p> <ul style="list-style-type: none"> Wet mop and vacuum area with a HEPA filtered vacuum as needed and when work is complete Wipe horizontal surfaces with a disinfectant <p>Medical/Nursing Staff</p> <p>1) <i>Construction/Renovation Activities</i></p> <p>a) Risk Reduction</p> <ul style="list-style-type: none"> Identify high risk patients who may need to be temporarily moved away from the construction zone Ensure that patient care equipment and supplies are protected from dust exposure
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Note: The above specifications are to be considered in addition to those listed in Class I.

Class III	<p>Engineer/Maintenance Staff & Contractors</p> <p>1) <i>Construction/Renovation Activities</i></p> <p>a) Risk Reduction</p> <ul style="list-style-type: none"> Ensure that IPAC consultation has been completed and Infection Prevention and control measures have been approved. <p>b) Dust Control</p> <ul style="list-style-type: none"> Erect an impermeable dust barrier from true ceiling (includes area above false ceiling) to the floor consisting of 2 layers of 6ml polyethylene or sheetrock. Ensure that windows, doors, plumbing penetrations, electrical outlets and intake and exhaust vents are properly sealed with plastic and duct tape within the construction/renovation area. Vacuum air ducts and spaces above ceilings if necessary. Ensure that construction workers wear protective clothing that is removed each time they leave the construction site before going into patient care areas. Do not remove dust barrier until the project is complete and
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	<p>the area has been cleaned thoroughly and inspected.</p> <ul style="list-style-type: none"> • Remove dust barrier carefully to minimize spreading dust and other debris particles associated with the construction project. <p>c) Ventilation</p> <ul style="list-style-type: none"> • Maintain negative pressure within the construction zone by using portable HEPA equipped air filtration units. • Ensure air exhausted directly outside and away from intake vents or filtered through a HEPA filter before being recirculated. • Ensure ventilation system is functioning properly and is cleaned if contaminated by soil or dust after construction or renovation project is complete. <p>d) Debris Removal & Cleanup</p> <ul style="list-style-type: none"> • Remove debris at the end of the workday. • Erect an external chute if the construction is not taking place on the ground level. • Vacuum work area with HEPA filtered vacuums daily or more frequently if needed. <p>2) Plumbing Activities</p> <ul style="list-style-type: none"> • Flush water lines at construction or renovation site and adjacent patient care areas before patients are readmitted. <p>Environmental Services</p> <p>1) Construction/Renovation Activities</p> <ul style="list-style-type: none"> • Increase frequency of cleaning in areas adjacent to the construction zone while the project is under way. • In collaboration with the ICP ensure that construction zone is thoroughly cleaned when work is complete. <p>Infection Prevention and Control Personnel</p> <p>1) Construction/Renovation Activities</p> <p>a) Risk Reduction</p> <ul style="list-style-type: none"> • Move high-risk patients who are in or adjacent to the construction area. • In collaboration with environmental services ensure that construction zone is thoroughly cleaned when work is complete. • Inspect dust barriers. <p>b) Traffic Control</p> <ul style="list-style-type: none"> • In collaboration with the facility project manager designate a traffic pattern for construction workers that avoids patient care areas and a traffic pattern for clean or sterile supplies and equipment that avoids the construction area. <p>2) Plumbing Activities</p> <ul style="list-style-type: none"> • Consider hyperchlorinating or superheating stagnant potable water
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	<p>Medical/Nursing Staff</p> <p>1) Construction/Renovation Activities</p> <p>a) Risk Reduction</p> <ul style="list-style-type: none"> • Move high risk patients who are in or adjacent to the construction zone • Ensure that patients do not go near the construction area • In collaboration with environmental services and the ICP ensure that construction zone is thoroughly cleaned when work is complete.
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Note: The above specifications are to be considered in addition to those listed in Class I and II.

Class IV	<p>Engineer/Maintenance Staff & Contractors</p> <p>1) <i>Construction/Renovation Activities</i></p> <p>a) Dust Control</p> <ul style="list-style-type: none"> • Before starting the construction project erect an impermeable dust barrier that also has an anteroom • Place walk-off mat outside the anteroom in patient care areas and inside the anteroom to trap dust from workers' shoes, equipment and debris that leaves the construction zone. • Ensure that construction workers leave the construction zone through the anteroom so they can be vacuumed with a HEPA filtered vacuum cleaner before leaving the work site; or that they wear cloth or paper coveralls that are removed each time they leave the work site. • Direct all personnel entering the construction zone to wear shoe covers • Ensure that construction workers change the shoe covers each time they leave the work site • Repair holes in walls within 8 hours or seal them temporarily. • Ventilation • Ensure negative pressure is maintained within the anteroom and construction zone • Ensure ventilation systems are working properly in adjacent areas • Review ventilation system requirements in the construction area with ICP to ensure system is appropriate and is functioning properly <p>Evaluation</p> <ul style="list-style-type: none"> • Review infection control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of the construction project. <p>2) <i>Plumbing Activities</i></p> <ul style="list-style-type: none"> • If there are concerns about <i>Legionella</i>, consider hyperchlorinating stagnant potable water or superheating and flushing all distal sites before restoring or repressurizing the water system.
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	<p>Environmental Services</p> <p>1) <i>Construction/Renovation Activities</i></p> <p>a) Evaluation</p> <ul style="list-style-type: none">• Review Infection Prevention and control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of the construction project <p>Infection Prevention and Control Personnel</p> <p>1) <i>Construction/Renovation Activities</i></p> <p>a) Risk Reduction</p> <ul style="list-style-type: none">• Regularly visit the construction site to ensure that preventive measures are being followed. Wear coveralls and shoe covers when visiting the site <p>b) Evaluation</p> <ul style="list-style-type: none">• Review infection control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of the construction project <p>2) <i>Plumbing Activities</i></p> <ul style="list-style-type: none">• If there are concerns about Legionella, consider hyperchlorinating stagnant potable water or superheating and flushing distal sites before restoring or repressurizing the water system <p>Medical/Nursing Staff</p> <p>Staff are not permitted to visit the construction site.</p> <p>1) <i>Construction/Renovation Activities</i></p> <p>a) Evaluation</p> <ul style="list-style-type: none">• Review infection control measures with other members of the planning team or delegate to evaluate their effectiveness and identify problems at the end of the construction project. <p>2) <i>Plumbing Activities</i></p> <ul style="list-style-type: none">• Consider using another source of potable water for patients who are at greatest risk until potable water has been cleared for signs of <i>Legionella</i> after major plumbing installation/repairs.
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Note: The above specifications are to be considered in addition to those listed in Class I, II, and III.

Module Evaluation

Dear ICP,

These modules have been developed to help make orientation to Infection Prevention & Control (IPAC) a worthwhile experience. Your feedback on the modules will be greatly appreciated and will help us make changes that may be necessary. In addition to filling out the boxes please fill in the comments section to tell us exactly how you found these modules. Please provide the feedback to your mentor. Your mentor will provide the information to the Provincial Infection Control Nurse Specialist at marionyetman@gov.nl.ca

Please complete an evaluation for each module.

Module Name: _____

Section 1: Module Content

	Strongly Disagree	Disagree	Agree	Strongly agree
1. The module objectives were clearly stated.				
2. The presentation of the material was clear and systematic.				
3. The information in the modules was consistent with the stated objectives.				
4. The information was in the required readings.				
5. The module contained information I needed to know.				
6. The readings were useful.				
7. The instructions were clear.				
8. The amount of time given to each module was adequate.				
Comments:				

Section 2: Critical Thinking/Problem Solving Skills in IPAC

	Strongly Disagree	Disagree	Agree	Strongly agree
9. This module utilized “real life” Infection Prevention and Control situations.				
10. The module helped me to develop my abilities to think critically and independently in my own work.				
11. The module content allowed me to gain useful problem solving skills for my own work.				
Comments:				

Section 3: Additional Comments/Suggestions

Keeping in mind that this is an orientation package and not meant to replace an accredited Infection Control course; do you now feel better prepared to begin your role as an ICP?

Do you have any suggestions on how we can improve this module or the overall orientation program?