APPENDIX A

PICNet
PROVINCIAL INFECTION CONTROL NETWORK OF BRITISH COLUMBIA
A program of the Provincial Health Services Authority

British Columbia Best Practices for Environmental Cleaning for Prevention and Control of Infections in All Healthcare Settings and Programs

The Provincial Infection Control Network of British Columbia (PICNet)
Vancouver, British Columbia
September 2016

THIS DOCUMENT IS INTENDED TO PROVIDE BEST PRACTICES ONLY.

HEALTHCARE SETTINGS AND PROGRAMS ARE ENCOURAGED TO WORK TOWARDS THESE BEST PRACTICES IN AN EFFORT TO IMPROVE QUALITY OF CARE.

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Foreword

This document was adapted by the Provincial Infection Control Network (PICNet) and the British Columbia Environmental Cleaning Working Group with permission from the originating source, the Ontario Agency for Health Protection and Promotion's Provincial Infectious Diseases Advisory Committee on Infection Prevention and Control (PIDAC-IPC).

The Ontario Agency for Health Protection and Promotion (Public Health Ontario) is a Crown corporation dedicated to protecting and promoting the health of all Ontarians and reducing inequities in health. PIDAC-IPC is a multidisciplinary scientific committee of healthcare professionals with expertise and experience in infection prevention and control. The committee advises Public Health Ontario on the prevention and control of healthcare-associated infections (HAI), considering the entire healthcare system for protection of both patients and healthcare providers. PIDAC-IPC's work is guided by the best available evidence and updated as required. Best practice documents and tools produced by PIDAC-IPC reflect consensus positions on what the committee deems prudent practice and are made available as a resource to public health and healthcare providers.

The Provincial Infection Control Network of British Columbia (PICNet) is a provincial program of the Provincial Health Services Authority (PHSA) with a specific interest in the prevention and control of healthcare-associated infections. PICNet works with partners on province-wide surveillance initiatives, development and promotion of evidence-based best practices, and the creation of educational and operational tools. Its membership (community of practice) includes experts in infection prevention and control, occupational health and safety, public health, infectious disease, patient safety and quality, microbiology laboratories, and other interested parties.

Acknowledgments

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Ontario Agency for Health Protection and Promotion, Provincial Infectious Diseases Advisory Committee. *Best Practices for Environmental Cleaning for Prevention and Control of Infections in All Health Care Settings*. 2nd Revision. Toronto, ON: Queen's Printer for Ontario; 2012. PIDAC'S original best practice document is available at:
http://www.oahpp.ca/resources/documents/pidac/Environmental%20Cleaning%20BP_ENGLISH_FINAL_2012-07-15.pdf

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Acronyms

ABHR	alcohol-based hand rub
ATP	adenosine triphosphate
BC MoH	British Columbia Ministry of Health
CAEM	Canadian Association of Environmental Management
CDAD	*Clostridium difficile* associated diseases
CDC	Centers for Disease Control and Prevention (U.S.)
CDI	*Clostridium difficile* infection
CHICA-CA	Community and Hospital Infection Control Association - Canada
CPS	Central Processing Services
CSA	Canadian Standards Association
DIN	Drug Identification Number
EHP	enhanced hydrogen peroxide
ES	Environmental Services (inclusive of in-house and contracted housekeeping services)
FMO	Facilities Maintenance and Operations
HAI	healthcare-associated infection
HEPA	high-efficiency particulate air
HICPAC	Healthcare Infection Control Practices Advisory Committee (US)
HP	hydrogen peroxide
HP-EAF	hydrogen peroxide enhanced action formulation
ICP	Infection Prevention and Control Professional/Practitioner
IPAC	Infection Prevention and Control
LLD	low-level disinfection
MF	microfibre
MDRD	Medical Device Reprocessing Department (also known as CPS and SPD)
MSDS	material safety data sheet
NICU	Neonatal Intensive Care Unit
NPN	Natural Product Number
OHS	Occupational Health and Safety
ORNAC	Operating Room Nurses Association of Canada
PH	Public Health
PHAC	Public Health Agency of Canada
PICNet	Provincial Infection Control Network (British Columbia)
PIDAC-IPC	Provincial Infectious Diseases Advisory Committee on Infection Prevention and Control
PPE	personal protective equipment
PPM	parts per million
QUAT	quaternary ammonium compound
RICN	Regional Infection Control Networks (Ontario)
RLU	relative light unit
RSV	respiratory syncytial virus
SPD	Sterile Processing Department
UMF	ultramicrofibre
UV	ultraviolet
UVI	ultraviolet Irradiation
VHP	vapourized hydrogen peroxide
VOC	volatile organic compounds
WHMIS	Workplace Hazardous Materials Information System

1. Introduction

The environment around the patient influences the incidence of infection in hospitals and other healthcare settings[1-3]. Reducing the number of microorganisms in the healthcare environment is accomplished by cleaning and disinfection. Some countries, such as the United Kingdom[4] and Australia[5, 6] have developed cleaning standards to direct cleaning processes. A standard for hospital cleanliness is mandated in Germany under the German Infection Protection Act and the "Healthcare Service" Accident Prevention Regulation[7].

Healthcare-associated infections (HAI) remain a patient safety issue and represent a significant adverse outcome of the provision of care.[8, 9] With the changing trends in healthcare that have resulted in the provision of complex treatments outside of the acute care setting (e.g., ambulatory care, physician office), HAI have become a concern in healthcare settings across the continuum of care. A clean environment is imperative to the health and safety of the patient.

1.1 About This Document

This document is targeted to everyone who has a role in the cleaning and disinfection of the environment and of non-critical medical equipment in the healthcare setting. This includes, but is not limited to, administrators, supervisors of Environmental Services (ES) and departments providing care and services to patients, infection prevention and control professionals (ICP), supervisors of construction/maintenance projects, and public health investigators. It is inclusive of both in-house and contracted services.

The cleaning practices set out in this document are applicable in all settings where care is provided, across the continuum of healthcare, with the exception of cleaning of the client's home in home healthcare. Healthcare settings and programs should work towards these best practices in an effort to improve quality of care.

The term "patient" has been used throughout this document to refer to any client, patient, or resident receiving care within a healthcare setting across the continuum of care.

These best practices are meant to be used as a benchmark for in-house services, as a basis for specifications for contracted services, and as a framework for auditing cleaning services by ES supervisors, managers, and external auditors.

- See **Appendix A :** *Summary of Recommendations for Internal Self-Assessment of Best Practices for Environmental Cleaning* for a table that is intended to assist with self-assessment internal to the healthcare setting for quality improvement purposes.

This document deals with cleaning and disinfection of the physical environment in healthcare as it relates to the prevention and control of infections. It also deals with cleaning and disinfecting medical equipment that only comes into contact with intact skin (i.e., non-critical equipment). This document does not include high-level disinfection and sterilization of invasive medical equipment, or the use and disposal of chemicals or medications.

- For information about high-level disinfection and sterilization of medical equipment, see *Best Practices for Cleaning, Disinfection and Sterilization of Critical and Semi-Critical Medical Devices in BC Health Authorities* [10]available at: http://www.health.gov.bc.ca/library/publications/year/2011/Best-practice-guidelines-cleaning.pdf.
- For information about handling and using chemotherapy chemicals and equipment, see the *BC Cancer Agency Pharmacy Practice Standards for Hazardous Drugs*,[11] available at: http://www.bccancer.bc.ca/HPI/Pharmacy/GuidesManuals/safehandling.htm.

1.2 Evidence for Recommendations

The best practices in this document reflect the best evidence and expert opinion available at the time of writing. At regular intervals, this document will be reviewed and updated to incorporate new information and evidence.

- See **Appendix B**: *Ranking System for Recommendations*

FOR RECOMMENDATIONS IN THIS DOCUMENT:
Shall indicates mandatory requirements based on regulation (e.g., WorkSafe BC) **Should** indicates what is considered best practice. **Strongly recommended** indicates a preferred practice where conclusive evidence remains in development.

1.3 Assumptions and Best Practices in Infection Prevention and Control

The best practices in this document are based on the assumption that healthcare settings in British Columbia already have basic Infection Prevention and Control (IPAC) systems and/or programs in place or have an individual who is delegated responsibility for IPAC. For those healthcare settings that do not have dedicated Infection Prevention and Control professionals (ICPs) it is assumed that provincial IPAC resources, made available through health authority and PICNet websites, are being used as appropriate. It also assumes that healthcare settings are actively working to meet Accreditation Canada's Qmentum program standards for infection prevention and control[12] specific to their setting.

In addition to the general assumption above, these best practices are also based on the following assumptions and principles:

1. Healthcare settings have implemented programs that promote good hand hygiene practices and ensure adherence to standards for hand hygiene.
2. Collaboration between professionals involved in Public Health (PH), Occupational Health and Safety (OHS), and IPAC is promoted in all healthcare settings to implement and maintain appropriate infection prevention and control standards that protect workers.
3. All healthcare settings operate within the legislative requirements and contractual agreements applicable to them.

2. Best Practices for Environmental Cleaning Infrastructure Supports

2.1 Background

Healthcare settings are complex environments that contain a large diversity of microorganisms, many of which may constitute a risk to the patients, staff, and visitors in the environment. The transmission of microorganisms within a healthcare setting is intricate and very different from transmission outside healthcare settings, and the consequences of transmission may be more severe. High-touch environmental surfaces of the healthcare setting hold a greater risk than public areas of non-healthcare organizations due to the nature of activity performed in the healthcare setting and the transient behaviour of employees, patients, and visitors within the healthcare setting, which increases the likelihood of direct and indirect contact with contaminated surfaces and equipment.

All healthcare providers have a role in maintaining a clean and safe environment.

In the healthcare setting, the role of environmental cleaning is important because it reduces the number and amount of infectious agents that may be present, and may also eliminate routes of transfer of microorganisms from one person/object to another, thereby reducing the risk of infection.

The ease with which environmental cleaning can occur is dependent on a number of factors that can be classified as infrastructure supports. Some of these include:

- finishes and furnishings in the environment
- type of supplies and equipment used or kept in the area (i.e., patient space, unit)
- availability of designated storage space for medical equipment and supplies as well as environmental cleaning supplies.

For additional information on specific standards for the different infrastructure supports see:

- Canadian Standards Association's (CSA) *Standard Z8000-11 Canadian Health Care Facilities (September 2011)*[13]
  Available for purchase at:
  http://shop.csa.ca/en/canada/health-care-facility-engineering/z8000-11/invt/27033042011/
- Facility Guidelines Institutes' *Guidelines for Design and Construction of Health Care Facilities (2010)*.[14] Available for purchase at: http://www.fgiguidelines.org

In addition, adequate resources, including human resources, dedicated to cleaning and disinfection are required.

2.2 Selection of Finishes, Furnishings, and Equipment to Support Environmental Cleaning

The ease of cleaning is an important consideration in the choice of materials for healthcare settings. This applies to medical equipment and all finishes and surfaces including materials for floors, ceilings, walls, and furnishings.

Healthcare settings should have policies that include the criteria to be used when choosing finishes,

furnishings, and equipment for patient care areas. This includes donated furnishings and other donated items in the healthcare setting, which should meet IPAC requirements for cleaning and disinfection.

A process should be in place to support cleaning of the healthcare environment that includes:[15]

- choosing finishes, furnishings and equipment that can be cleaned and disinfected, especially where contamination with blood or body fluid is a possibility
- ensuring compatibility of materials, finishes, and equipment with hospital-grade cleaners, detergents and disinfectants prior to purchase
- obtaining written guidelines from the manufacturer on cleaning and disinfection of finishes, furnishings, and equipment
- establishing responsibility for cleaning prior to purchase and installation
- identifying when items can no longer be cleaned and disinfected due to damage.

If you can't clean it, don't buy it.

2.2.1 Cloth and Soft Furnishings in Healthcare Settings

In general, bacteria cannot be effectively removed from the surfaces of upholstered furniture. In addition, cloth furnishings have been shown to harbour higher concentrations of fungi than non-porous furnishings.[16, 17] Contaminated stuffing and foam cannot be decontaminated if breaks in fabric or leaks of body fluids or spills have occurred. Wherever feasible, an alternative to cloth surfaces should be used. Cloth items such as privacy curtains, pillows, mattresses and soft furnishings should: [18]

- be seamless where possible or have double-stitched seams
- be easily accessed for cleaning
- have removable covers for cleaning
- have foam cores that are resistant to mould
- be compatible with hospital grade detergents and disinfectants
- be quick-drying
- be maintained in good repair.

In all healthcare settings:

- a regular cleaning regimen should be in place; any item that is visibly contaminated with blood or body fluids should be immediately cleaned and disinfected or removed from the setting and replaced.
- the coverings on soft furniture should be cleanable with a hospital-grade disinfectant, except those furnishings in long-term care homes where the furniture is supplied and used exclusively by one single resident.[19]
- worn, stained or torn items should be replaced as soon as possible.
- upholstered furniture and other cloth or soft furnishings that cannot be cleaned and disinfected should not be used in care areas, particularly where immunocompromised patients are located.[16]

2.2.2 Carpeting

Carpet should not be used in areas that normally accommodate immunocompromised populations or in areas with a high likelihood of contamination with blood or body fluids.[16, 19] Carpeted floors have been shown to be significantly more heavily contaminated for prolonged periods with clinical strains of *Clostridium difficile* (*C. difficile)* than are non-carpeted floors, and room carpeting should be considered

a potential reservoir of this organism in outbreaks.[20]

Although there is no evidence that carpeting influences HAI rates, except in immunocompromised populations, the choice of whether to use carpeting in a particular care area needs to be based on: [16]

- the likelihood of spills of contaminated liquids (e.g., intensive care units, laboratory areas, areas around sinks) or alcohol-based hand rub (which could pose a flammability risk)
- the risk of infection from environmental pathogens in the patient population served by the area (e.g., burn units, intensive care units, operating rooms, transplant units).

If carpeting is used in other areas, the following should be considered:

- carpet should be cleanable with hospital-grade cleaners and disinfectants.[19]
- carpet tiles are preferred as they have the advantage of being easily removed, discarded and replaced.
- water-resistant backing allows for better drying of carpet with reduced likelihood of mould accumulation under the carpet. If carpeting is still wet after 48 hours, the risk of mould increases.[21] Carpeting that remains wet after 72 hours should be removed/replaced, or earlier at the direction of Facilities Maintenance and Operations (FMO) or IPAC.
- trained staff and specialized cleaning equipment and procedures are required for adequate carpet cleaning.[16]
- carpet age: older carpets accumulate deep dust which becomes surface and airborne dust after activity on the carpet.[22]
- the ease of removing stains to ensure the aesthetic appearance of the carpet, as this can be associated with cleanliness by patients, staff and visitors.[23]

2.2.3 Integrity of Plastic Coverings

Outbreaks of HAI, such as Vancomycin Resistant *Enterococcus* (VRE) and *Acinetobacter* spp., have been linked to plastic covers on mattresses. Exposure to pathogens may result when the covers become compromised and are no longer impervious to fluids.[24, 25] A process should be in place to identify torn covers and have them replaced.

To maintain the integrity of these coverings, the manufacturer's recommendations for choice of cleaner and disinfectant should be followed.

2.2.4 Electronic Equipment

Electronic equipment poses a challenge to environmental cleaning and disinfection. When purchasing new equipment, only keypads, mouse and monitors that may be easily cleaned and disinfected should be considered, and should be compatible with the healthcare setting's cleaning and disinfecting products. Plastic skins/sleeves may be effective for covering computer keyboards and monitors, remote controls, etc., allowing ease of cleaning.

All healthcare providers should be encouraged to perform hand hygiene prior to using electronic equipment.[26-31] Healthcare settings should identify who will be responsible for cleaning electronic equipment.

2.3 New Equipment and Product Purchases

When purchasing new, reusable non-critical medical equipment:

- purchase medical equipment that can be cleaned and disinfected using hospital grade cleaners

and disinfectants.[10]

- prior to purchase, identify who will have responsibility for cleaning and disinfecting the equipment.[32, 33]
- all non-critical medical equipment that will be purchased and will be cleaned and disinfected should include written item-specific manufacturer's cleaning and disinfection instructions. If disassembly or reassembly is required, detailed instructions with pictures should be included. Staff training should be provided on these processes before the medical equipment is placed into circulation (e.g., patient lifts, specialized chairs and beds).[10]
- items that are provided by outside agencies and returned to the agency for cleaning and disinfection are subject to the same standards as in-house equipment (e.g., therapeutic beds/mattresses).[24]

Equipment that is used to clean and disinfect equipment and surfaces should also meet the above criteria.

Sites should have a Products Standardization and Evaluation Committee or similar process to review new products requested for purchase, with a mandate to ensure that the organization can meet the cleaning and disinfection recommendations of the manufacturer and that cleaning responsibility has been designated (i.e. ES, direct care provider, Medical Devices Reprocessing Department). Representation from ES, OHS, and IPAC is strongly recommended.[10] These committees will interact with the Health Shared Services of BC and Shared Services of BC when group purchases are being considered.

Recommendations

➢ See **Appendix B**: *Ranking System for Recommendations*

1. ***Healthcare settings should have policies that include the criteria to be used when choosing finishes, furnishings, and equipment for patient care areas. [BIII]***
2. ***Infection Prevention and Control, Environmental Services, and Occupational Health and Safety should be involved in the selection of surfaces and finishes in healthcare settings. [BIII]***
3. ***In all healthcare settings:***
   - ***worn, stained, cracked or torn furnishings should be replaced when identified [AII]***
   - ***upholstered furniture and other cloth or soft furnishings that cannot be cleaned and disinfected should not be used in care areas, especially where immunocompromised patients are located; the healthcare facility should have a plan to replace cloth furnishings with furnishings that can be cleaned and disinfected. [BIII]***
4. ***Surfaces, furnishings, equipment and finishes in healthcare settings should:***
   - ***be easily maintained and repaired***
   - ***be cleanable with hospital-grade detergents, cleaners and disinfectants (except furnishings in residential facilities where the furniture is supplied and used exclusively by one single resident)***
   - ***be smooth, nonporous, seamless and unable to support microbial viability. [BII]***
5. ***Cloth items should:***
   - ***be easily maintained and repaired***
   - ***be seamless or double-stitched***

- ***be resistant to mould***
- ***be cleanable with hospital-grade detergents, cleaners and disinfectants***
- ***be quick-drying. [BII]***

6. ***Do not carpet areas that house or provide a service to patients or where there is a high likelihood of contamination with blood or body fluids. [BII]***
7. ***If used, carpet should:***
   - ***be cleanable with hospital-grade cleaners and disinfectants***
   - ***be cleaned by trained staff using specialized cleaning equipment and procedures***
   - ***be removed and replaced when worn or stained***
   - ***dry quickly to reduce the likelihood of mould accumulation. [BIII]***
8. ***Clean and disinfect plastic coverings with compatible agents on a regular basis and replace if damaged. [BII]***
9. ***Equipment that cannot be adequately cleaned, disinfected or covered, including electronic equipment, should not be used in the care environment. [BII]***
10. ***Non-critical medical equipment, including donated equipment and equipment provided by outside agencies, should be able to be cleaned and disinfected according to recommended standards. [BII]***
11. ***Non-critical medical equipment, including equipment provided by outside agencies, should have written, item-specific manufacturer's cleaning and disinfection instruction. [BII]***

2.4 Equipment Depots

Equipment depots are centralized storage areas within healthcare facilities that function to support storage and distribution of patient care equipment. They address quality and safety issues within the healthcare facility by ensuring clean and operational patient care equipment, and by reducing clutter throughout patient care areas of the facility. It is strongly recommended that equipment depots be considered for all new facility construction and major facility renovations.

In the development of an equipment depot the following is required:

- space dedicated solely for the storage of clean, operationally sound equipment; and not used for any other purpose
- adjacent space for a decontamination room meeting CSA Standards Z314.8 *Decontamination of Reusable Medical Devices*[34]
- physical separation between the decontamination room and the storage area
- written procedures that
  - direct the movement of equipment between the equipment depot and the patient care area
  - ensure equipment stored in the equipment depot is decontaminated in the decontamination room only and not in the storage area
  - incorporate a “clean” tag system
  - identify the responsibilities specific to depot staff, ES, and FMO
  - include an auditing process.

To achieve the maximum operational functioning of an equipment depot, it is important to involve nursing, portering services, FMO, ES, and IPAC in the development and implementation stages to ensure that the concept is understood and the necessary processes are in place.

A clean tag system is an integral part of an equipment depot and provides a number of quality checks of the process, as it:

- requires a signature and tagging completed by ES staff indicating that the equipment has been cleaned and is ready to leave the unit
- includes a visual inspection by portering staff that the equipment is visually clean
- requires a signature and retagging completed by depot staff indicating that the equipment is safe (clean and functional)
- communicates to direct care providers that the equipment is clean and safe when it is delivered to them for use.

➢ See **Appendix C** *Equipment Depot Clean Tag System and Equipment Depot Cleaning Schedule* for more information on the equipment depot, developed and shared by the Vancouver Island Health Authority.

Recommendations

12. Equipment depots are strongly recommended for inclusion in new facility construction or major facility renovations.[BIII]

2.5 Clean Supply Rooms and Soiled Utility Rooms

2.5.1 Clean Supply Rooms

Each patient care area should be equipped with a room/area that is used to store clean supplies and equipment (if a depot is not available). A clean supply room/area should: [14]

- be separate from soiled workrooms or soiled holding areas
- have a door that is kept closed at all times
- be able to keep supplies free from dust and moisture and stored off the floor
- be adjacent to usage areas and easily available to staff
- be equipped with a work counter and dedicated hand washing sink if used for preparing patient care items, positioned in a manner to prevent splash or spray on supplies
- have an alcohol-based hand rub dispenser available in the immediate proximity of the door.

Sinks and counters should be cleaned and disinfected daily. The rest of the room should be inspected on a daily basis, cleaned if visibly soiled, and cleaned thoroughly on a regularly scheduled basis.

2.5.2 Soiled Utility Rooms

Each patient care area should be equipped with a room that may be used to clean soiled patient equipment that is not sent for medical device reprocessing (e.g., IV poles, commode chairs). A soiled utility room should: [13, 14]

- be physically separate from other areas, including clean supply/storage areas
- have a door that is kept closed at all times
- be designed to minimize the distance from point-of-care
- have a work counter and clinical sink (or equivalent flushing-rim fixture) with a hot and cold mixing faucet
- have a dedicated hand washing sink with both hot and cold running water
- have adequate space to permit the use of equipment required for the disposal of waste, including washers/disinfectors

- have PPE available to protect staff during cleaning and disinfecting procedures
- be adequately sized within the unit.

If a soiled utility room is used only for temporary holding of soiled materials, the work counter and clinical sink is not required. If the room includes equipment for cleaning bedpans, a hand washing sink should be present.[14] Soiled utility rooms/workrooms should not be used to store unused equipment.

High touch surfaces, including sinks and counters, in soiled utility rooms/workrooms should be cleaned and disinfected on a daily basis. The room should be cleaned thoroughly on a regularly scheduled basis.

Recommendations

13. Clean supply rooms/areas should:

- ***be readily available in each patient care area***
- ***be separate from soiled areas***
- ***have a door that is kept closed at all times***
- ***protect supplies from dust and moisture , and ensure storage off the floor***
- ***be easily available to staff***
- ***contain a work counter and dedicated hand washing sink if used for preparing patient care items, but placed in a manner to prevent splash onto clean supplies***
- ***have sinks and counters cleaned daily, other areas spot cleaned daily, and cleaned thoroughly on a regularly scheduled basis [BII]***

14. Soiled utility rooms/workrooms should:

- ***be readily available close to point-of-care in each patient care area***
- ***be separate from clean supply/storage areas***
- ***have a door that is kept closed at all times***
- ***contain a work counter and clinical sink***
- ***contain a dedicated hand washing sink***
- ***contain equipment required for the disposal of waste***
- ***contain personal protective equipment for staff protection during cleaning and disinfection procedures***
- ***be sized adequately for the tasks required***
- ***have high-touch surfaces, including sinks and counters, cleaned daily, and room cleaned thoroughly on a regularly scheduled basis [BII]***

2.6 Environmental Services Storage Rooms and Equipment

ES storage rooms should be provided throughout the facility to maintain a clean and sanitary environment, with at least one per patient floor.[6, 14]

Selection of ES cleaning equipment should follow ergonomic principles. Care should be taken in the choice of buckets, mops and other materials. Due to the repetitive nature of many of the tasks, products that are lighter in weight, easily emptied and having adjustable handle length help reduce the risk of injury.

Recommendations

15. ***Sufficient environmental services storage rooms should be provided throughout the facility to maintain a clean and sanitary environment. [BIII]***
16. ***Environmental services storage rooms:***
    - ***should not be used for other purposes***
    - ***should be situated in proximity to the unit cleaned***
    - ***shall be maintained in accordance with good hygiene practices***
    - ***shall have appropriate personal protective equipment available***
    - ***shall have an appropriate water supply and a sink/floor drain***
    - ***should include a dispensing system for chemicals***
    - ***shall be well ventilated and suitably lit***
    - ***should have locks fitted to all doors and locked when not in use***
    - ***should be appropriately sized to the material and equipment stored in the room***
    - ***should not contain personal supplies, food, or beverages***
    - ***shall have safe chemical storage and access***
    - ***shall have WHMIS information readily available***
    - ***should be free from clutter***
    - ***should be ergonomically designed***
    - ***should be cleaned on a regularly scheduled basis. [BII]***
17. ***Selection of environmental services cleaning equipment should follow ergonomic principles. [AII]***

2.7 Cleaning and Disinfecting Products

2.7.1 Choosing a Cleaning Product

Cleaning is the removal of foreign material (e.g., dust, soil, organic material such as blood, secretions, excretions and microorganisms) from a surface or object. Cleaning physically removes rather than kills microorganisms, reducing the organism load on a surface. It is accomplished with water, detergents, and mechanical action. The keys to cleaning are the use of friction to remove microorganisms and debris, and taking the time to ensure all surfaces are wiped.

Cleaning products used in the healthcare setting:

- should be approved for use by the organization
- should be used according to the manufacturers' recommendations for dilution, temperature, water hardness, and use
- should be used according to the product's Material Safety Data Sheet (MSDS).

2.7.2 Choosing a Disinfectant

Disinfection is a process used on inanimate objects and surfaces to kill microorganisms. Disinfection will kill most disease-causing microorganisms, but may not kill all bacterial spores.

Disinfectants are only to be used to disinfect, and should not be used as general cleaning agents unless the manufacturer has combined the disinfectant with a cleaning agent and claims that it can be used as a cleaner/disinfectant.[35] Skin antiseptics should never be used as environmental disinfectants (e.g.,

alcohol-based-hand rub, chlorhexidine gluconate). Conversely, disinfectants labelled as environmental disinfectants should never be used as skin antiseptics.

The following factors influence the choice of product used:[16]

- All disinfectants shall have a drug identification number (DIN) from Health Canada (http://www.hc-sc.gc.ca/dhp- mps/prodpharma/databasdon/index-eng.php).
- If the product is an alcohol, it should have a natural product number (NPN)
- The item to be disinfected (e.g., liquid disinfectant may damage electronic equipment, chlorine-containing materials may corrode metals).[36]
- The innate resistance of expected microorganisms to the inactivating effects of the disinfectant (e.g., a sporicidal agent to remove spores).
- The amount of organic soil present.
- The duration of contact time required for efficacy at the usual ambient temperature of the healthcare setting.
- If using a proprietary product, other specific indications and directions for use.
- Occupational health considerations:
  - some products may have occupational exposure limits for gases or vapours. A risk assessment and inclusion in the agency's exposure control plan is required before use
  - many surface disinfectants contain quaternary ammonium compounds (QUATs), phenolics, hydrogen peroxide, or sodium hypochlorite, which can cause skin and respiratory irritation
  - disinfectants are one of the leading allergens affecting healthcare providers [37, 38]
  - staff will be more likely to use products that are non-toxic and non-irritating
- Environmental protection:
  - consider products that are biodegradable and safe for the environment
  - many disinfectants may be hazardous both during manufacture and when they are discharged into the waste stream, as they are not readily biodegradable.
- All disinfectants should be approved for use by the organization.
- All disinfectants shall be used according to the product's Material Safety Data Sheet (MSDS).

2.7.3 Disinfectant Wipes

Disinfectant wipes are another means of cleaning and disinfecting surfaces and non-critical medical equipment, especially when surfaces and equipment require a second clean and disinfection within the day. They also provide a readily available means for the direct care provider to do point-of-care cleaning and disinfecting of patient equipment between patient uses. Consideration in determining whether to use ready-to-use (RTU) wipes needs to include the increased garbage volume and the potential of plumbing issues if discarded inappropriately. Sporicidal wipes,[39, 40] when used with adequate contact time, have demonstrated efficacy in reducing colony counts for *C. difficile*.

When using disinfectant wipes:

- The active ingredient should be an appropriate hospital-grade disinfectant.
- Wipes should be kept wet and discarded if they become dry.
- Wipes shall have an MSDS and be used according to the MSDS.
- Disinfectant wipes are used for:
  - items in the care environment that will not tolerate soaking
  - items that should be disinfected between patients at the point-of-care.
- If using these wipes for disinfection of large pieces of equipment, multiple wipes are required.
- Use wipes according to manufacturer's recommendations and contact time.

Recommendations

18. ***Cleaning and disinfecting products should:***
    - ***be approved for use by the organization***
    - ***have a drug identification number (DIN) from Health Canada***
    - ***be compatible with items and equipment to be cleaned and disinfected***
    - ***be used according to the manufacturer's recommendations and contact times. [BII]***
19. ***Disinfectants chosen for use in healthcare should:***
    - ***be active against the usual microorganisms encountered in the healthcare setting***
    - ***ideally require little or no mixing or diluting (or dispensed with automatic dispenser)***
    - ***be active at room temperature with a short contact time***
    - ***have low irritancy and allergenic characteristics***
    - ***be safe for the environment. [BIII]***

2.8 Resources for Environmental Services

Adequately staffed ES departments are one of the most important factors that govern the success of environmental cleaning in a healthcare setting. [13]

2.8.1 ES Staffing Levels

ES staffing levels should be appropriate to each department of the healthcare facility, with the ability to increase staffing in the event of outbreaks. Cooperation and collaboration between nursing and ES staff is enhanced when staff are dedicated to specific areas and are seen as part of the team.

ES supervisory staffing levels should be appropriate to the number of staff involved in cleaning.[41, 42] Supervisory staff have responsibilities to ensure staff training and compliance when using PPE. Supervisors are also responsible for training and auditing staff on cleaning and disinfecting procedures. Adequate supervisory staffing levels will help ensure that these requirements are being met.

Education and training are important factors in determining average cleaning time: a new worker will not work at the same pace and as efficiently as an experienced worker. Written procedures and checklists for cleaning will assist in standardizing cleaning and disinfection times and will ensure that items are not missed during the cleaning.

Each healthcare setting is encouraged to perform their own time management studies to determine appropriate staffing levels for cleaning and supervisory staff, taking into consideration the following factors:

- building factors (such as age, design, size, types of floor and wall surfaces, presence of carpet and upholstered furniture)
- occupancy factors (such as occupancy rates, patient mix, type of care, turnover due to number and frequency of discharges/transfers, and reflect the busy times during the day)
- average percentage of rooms requiring cleaning and disinfection other than routine cleaning, due to outbreaks or need for donning/doffing PPE
- equipment factors (such as type and amount of medical equipment in patient area, degree of automation of the cleaning equipment, cleaning and disinfection methodology, placement of ES closets and supplies)
- factors in relation to supervisors (such as amount and level of training for new staff, staff

turnover rates, amount of auditing activities, amount of regulatory responsibility)
- training factors in relation to staff (such as staff experience).

2.8.2 Additional Healthcare Cleaning Practices

In addition to routine cleaning, additional or enhanced cleaning practices may be required in healthcare settings for microorganisms of special environmental significance due to their survival in the environment and/or mode and ease of transmission (e.g., *C. difficile*); or to contain the spread of the microorganism during outbreak situations (e.g., norovirus).

Policies and procedures regarding staffing in ES departments should allow for surge capacity (i.e., additional staff, supervision, supplies, equipment) to address these circumstances.

- PICNet CDI Working Group of British Columbia developed a toolkit that provides consistent, evidence-informed, provincial processes for the management of *C. difficile* infections. It provides recommendations regarding surveillance, case identification, clinical management, infection prevention and control, and environmental management.
  See *British Columbia Clostridium Difficile Infection Toolkit and Clinical Management Algorithm (2012)*,[43] available at: http://s.picnet.ca/CDItoolkit.

2.8.3 Education

All aspects of environmental cleaning should be supervised and performed by knowledgeable, trained staff. Regular education and support should be provided to help staff consistently implement appropriate IPAC practices.[33] Education should be provided at the initiation of employment as part of the orientation process and as ongoing continuing education. Frequency of continuing education is dependent on factors such as but not limited to, regular need for review of practices and processes, common non-compliant practices identified through performance observation, and newly implemented processes and technologies.

WorkSafeBC Occupational Health and Safety Regulations require that training be provided to address potential work related hazards.[44, 45] For ES, this shall include:
- safe handling and application of cleaning agents and disinfectants
- safe waste handling (general, biomedical, sharps)[45,46]
- WHMIS training relating to the use of cleaning agents and disinfectants.

It should also include the following topics:
- handling of mops, cloths, and cleaning equipment
- cleaning and disinfection of blood and body fluids
- appropriate work flow (clean to dirty; top to bottom)
- techniques for cleaning and disinfection of surfaces and items in the healthcare environment
- techniques for cleaning and disinfection of rooms under additional precautions
- steps to follow for the different types of cleans
- transport and disposal of hazardous materials.

Education provided to ES staff should be developed collaboratively by IPAC and ES staff, and be consistent with IPAC and OHS policies and practices for the healthcare setting, and should include: [47]
- the correct and consistent use of routine practices
- the Provincial (BC) Hand Hygiene online module

- signage used to designate additional precautions in the healthcare setting
- the appropriate use of PPE, including selection, safe application, removal, and disposal
- a respiratory protection program
- prevention of blood and body fluid exposure, including sharps safety.

In order to meet the requirements of their job, management and supervisory staff also should be trained and knowledgeable in cleaning standards and practices. In addition, they should have knowledge of:

- the chain of transmission for infection
- how to deal with pest infestation issues
- outbreak response.

2.8.4 Contracted Services

When ES are contracted out, the contract should clearly outline responsibilities, including those that relate to infection prevention and control. These should include not only the environmental services procedures, cleaning frequency, and expected outcomes, but also the contracting agency's responsibility for mandatory education of staff and employee health.[41] Contract staff should work collaboratively with Nursing, IPAC, and OHS.

2.8.5 Occupational Health and Safety Considerations

ES staff are exposed to chemical agents and may be exposed to the same infectious agents in the workplace as are direct care providers. Many tasks may require the use of personal protective equipment for protection from chemicals or microorganisms. There are also many ergonomic issues related to ES activities, such as pushing, pulling, lifting, and twisting. These OHS issues shall be addressed by all healthcare settings, regardless of the manner in which the ES service is provided.

2.8.5.1 Immunization

ES staff shall be offered appropriate immunizations. Immunizations should be based on the British Columbia Centre for Disease Control's Communicable Disease Control Manual[48] and the National Advisory Committee on Immunization[49] recommendations for healthcare providers. Immunizations appropriate for staff in healthcare include:

- annual influenza vaccine
- measles, mumps, rubella (MMR) vaccine
- varicella vaccine
- up-to-date tetanus vaccine
- hepatitis B vaccine (ES staff may be exposed to contaminated sharps)
- acellular pertussis vaccine.

Contracts with supplying agencies should include the above immunizations for contracted staff.

2.8.5.2 Staff Exposures

There shall be written policies and procedures for the evaluation of staff (employees or contract workers) who are, or may be, exposed to blood or body fluids and other infectious hazards that include:

- a sharps injury prevention program[47]
- timely post-exposure follow-up and prophylaxis when indicated[47, 50, 51]
- a respiratory protection program if staff are entering an airborne infection isolation room
- mechanism for following staff who have been exposed to tuberculosis
- review and reporting of exposures to both IPAC and OHS.

2.8.5.3 Chemical Exposures

ES workers have potential exposures to chemicals and, in some circumstances, may develop symptoms related to these exposures.[52] Typically the exposures are either through inhalation (respiratory) or dermal (skin) exposure. Chemicals can function as irritants (e.g., products containing sodium hypochlorite (bleach), ammonia, hydrogen peroxide) or sensitizers (e.g., quaternary ammonium compounds), and can result in respiratory symptoms or dermatitis.

It is important that any healthcare provider who has a significant allergic or asthmatic or dermatitis history, or who develops symptoms that may be related to work exposures, be assessed by OHS.

Exposure to workplace chemicals shall be reduced through the use of engineering controls (e.g., good ventilation, improved design of containers and delivery systems)[53] and the use of personal protective equipment (e.g., proper glove choice when handling chemicals, use of facial appropriate protection to prevent inhalation of vapours and splashes of chemicals to the eyes). Applications of cleaning chemicals by aerosol or trigger sprays may cause eye injuries or induce or compound respiratory problems or illness, and should not be used. [52]

Chemicals shall be stored and handled appropriately. Healthcare settings shall have written policies and procedures in place, in accordance with the Workplace Hazardous Materials Information System (WHMIS).[50] All cleaning staff shall receive WHMIS training and know the location of the MSDS for each of the cleaning and disinfecting agents they use.[44] Where appropriate, eyewash stations should be available and accessible.

- MSDS documentation is available as required by the *Workplace Hazardous Materials Information System (WHMIS)*, R.R.O. 1990, Reg. 860 Amended to O. Reg. 36/93 Information on WHMIS is available from Health Canada website at: http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/index_e.html.

Recommendations

20. Adequate resources, including human resources, should be devoted to Environmental Services (regardless of in-house or contracted services) in all healthcare settings that include:

- ***single individual with assigned overall responsibility for the cleanliness of the physical environment***
- ***adequate human resources to allow thorough and timely cleaning and disinfection***
- ***adequate human resources to allow surge capacity during outbreaks, without compromise to other routine cleaning and disinfection***
- ***education and continuing education of cleaning staff by staff trained and knowledgeable in cleaning standards and practices***
- ***adequate time and resources to audit cleaning compliance and process review, and monitor staff performance***
- ***ongoing review of procedures. [BII]***

21. If environmental services are contracted out, the Infection Prevention and Control and Occupational Health and Safety policies of the contracting services should be consistent with the facility's policies. [BII]

22. ***Environmental Services staffing levels should reflect the physical nature and the acuity of the facility; levels of supervisory staff should be appropriate to the number of staff involved in cleaning. [BIII]***

23. ***Each healthcare setting should have policies and procedures to ensure that cleaning:***

    - ***takes place on a continuous and scheduled basis***
    - ***incorporates principles of infection prevention and control***
    - ***clearly defines cleaning responsibilities and scope***
    - ***meets all statutory requirements***
    - ***allows for surge capacity during outbreaks, without compromise to other routine cleaning and disinfection. [BIII]***

24. ***All aspects of environmental cleaning should be supervised and performed by knowledgeable, trained staff. [BIII]***

25. ***Environmental Services should provide a training program which includes:***

    - ***a written curriculum***
    - ***a mechanism for assessing proficiency***
    - ***documentation of training and proficiency verification***
    - ***orientation and continuing education. [BIII]***

26. ***Infection prevention and control education provided to staff working in Environmental Services should be consistent with Infection Prevention and Control and Occupational Health and Safety policies and practices of the healthcare setting and should include:***

    - ***the correct and consistent use of routine practices***
    - ***hand hygiene***
    - ***signage used to designate additional precautions in the healthcare setting***
    - ***the appropriate use of personal protective equipment (PPE)***
    - ***prevention of blood and body fluid exposure, including sharps safety. [BIII]***

27. ***Environmental Services managers and supervisors should be trained and knowledgeable in cleaning and disinfection processes, as well as infection prevention and control principles. [BIII]***

28. ***Environmental Services staff should be offered appropriate immunizations. [AII]***

29. ***There shall be policies and procedures in place that include a sharps injury prevention program; post- exposure prophylaxis and follow-up; and a respiratory protection program for staff who may be required to enter a room accommodating a patient with tuberculosis, thus requiring airborne precautions be in place.***

30. ***There should be appropriate attendance management policies in place that establish a clear expectation that staff do not come into work when acutely ill with a probable infection or symptoms of an infection. [AII]***

31. ***Aerosol or trigger sprays for cleaning chemicals should not be used. [BIII]***

32. ***There should be procedures for the evaluation of staff who experience sensitivity or irritancy to chemicals. [AII]***

3. Best Practices for Cleaning and Disinfection

Cleaning and disinfection best practices are designed to meet the following needs:

- Primary focus should remain the protection of the patient, staff and visitors.
- Practices should help minimize the spread of infections.
- Practices are understandable and attainable.
- Practices incorporate workflow measurement to guide human resource issues.
- Practices should be reviewed annually to keep abreast of changes in the healthcare environment.

Environmental cleaning should be performed on a routine and consistent basis to provide for a safe and sanitary environment. The objective of cleaning efforts should be to keep surfaces visibly clean, to clean high-touch surfaces more frequently than low-touch surfaces, and to clean up spills promptly.[54] Cleaning procedures should be effective and consistent to prevent the build-up of soil, dust, and debris that can harbour microorganisms and support their growth. Maintaining a clean and safe healthcare environment is an important component of patient safety and infection prevention and control.

3.1 Infection Prevention and Control Practices

3.1.1 Routine Practices

ES staff should adhere to routine practices when cleaning. The principles of routine practices are based on the premise that all patients, their secretions, excretions and body fluids and their environment might potentially be contaminated with harmful microorganisms. By following simple preventive practices at all times regardless of whether or not an illness is 'known', staff will be protecting patients and themselves from an unknown, undiagnosed infectious risk.

3.1.1.1 Hand Hygiene

Hand hygiene is the most important and effective IPAC measure to prevent the spread of healthcare-associated infections. Hand hygiene should be practiced:

- before initial contact with a patient or items in their environment, even if the patient is not touched (e.g., before coming into the patient room or bed space)
- before putting on gloves
- after potential blood or body fluid exposure, such as:
  - after cleaning bathroom
  - after handling soiled linen, equipment or waste in a patient room or patient environment
  - for facility based waste and soiled linen runs:
    - after completing the run in facilities involving pickup in one area only; gloves are removed and discarded, hand hygiene is performed
    - on exit from unit, when pickup involves multiple areas/units prior to completion of run; gloves are removed and discarded, hand hygiene is performed
- after contact with a patient or items in their immediate surroundings when leaving, even if the patient has not been touched (e.g., after cleaning patient room; after cleaning equipment such as stretchers; after changing mop heads)
  - in a single-bed room, gloves are removed and hand hygiene is done after the room and bathroom are cleaned; providing the bed space is cleaned first
  - in a multi-bed room, gloves are removed and hand hygiene is done between bed spaces and between bed space and bathroom

It is necessary to **clean hands after removing gloves** as gloves do not provide complete protection against hand contamination.[55, 56] The use of gloves does not replace the need for hand hygiene.

ABHR is the preferred method for hand hygiene after activities that do not result in visible soiling of the hands,[57-61] such as dusting, mopping, and vacuuming, because they provide for the rapid kill of most transient microorganisms, are less irritating to the skin, and are less time-consuming than washing with soap and water.

Dedicated hand washing sinks are required for hand washing with soap and water. Hand washing sinks should not be used for other purposes, such as disposal of fluids or cleaning of equipment, to avoid splash back of microorganisms onto clean hands during rinsing.

- See BC Ministry of Health's Best practices for Hand Hygiene in all Healthcare Setting and Programs. July 2012.[62] Available at: http://www.health.gov.bc.ca/library/publications/year/2012/best-practice-guidelines-handhygiene.pdf

3.1.1.2 Personal Protective Equipment (PPE)

Personal protective equipment (PPE) for healthcare providers refers to a variety of barriers used alone or in combination to protect mucous membranes, airways, skin, and clothing from contact with infectious agents and from chemical agents. ES staff should wear PPE:

- for protection from microorganisms
- for protection from chemicals used in cleaning
- to prevent transmission of microorganisms from one patient environment to another.

Healthcare settings shall ensure that:

- PPE is sufficient and accessible for all ES staff for routine practices, additional precautions and for personal protection from chemicals used in cleaning
- WHMIS training regarding appropriate handling of chemical hazards is provided
- individualized training is provided in the correct use, application and removal of PPE
- ES staff who are required to wear N95 or other respirators for airborne infection isolation are fit-tested in accordance with a respiratory protection program that is compliant with the WorkSafe BC .[63]

Glove Use in Environmental Services

Prolonged wearing of gloves is not recommended because of the increased risk of irritant contact dermatitis from sweat and moisture within the glove, as well as breakdown of the glove material itself and increasing risk of tears.

Inappropriate use of gloves, such as going from room to room, bed space to bed space, or patient environment to other areas in a healthcare facility with the same pair of gloves, facilitates the spread of microorganisms. Gloves should be removed immediately after the activity for which they were used and discarded.[64, 65] In addition,

- Do not substitute gloves for hand hygiene; use them as an additional protective measure.
- Do not wash or re-use disposable gloves.
- Change or remove gloves after contact with a patient environment and before contact with another patient environment.

- Perform hand hygiene after removing gloves.

It is important to assess and select the most appropriate glove to be worn for the activity about to be performed. Selection of gloves should be based on a risk analysis of the type of setting, the task that is to be performed, likelihood of exposure to body substances, length of use, and amount of stress on the glove.[64, 65] The glove requirements identified in the MSDS shall be followed when using a chemical agent. In general,

- Disposable vinyl gloves can be used for routine daily cleaning and disinfecting procedures in patient care areas and public washrooms.
- Nitrile gloves are recommended for wet work of long duration when durability is required, for discharge/transfer cleaning and for contact with certain chemical powders and solutions.
- Household utility gloves are only acceptable for cleaning in non-care areas, with the exception of public washrooms where disposable gloves are used.
- Heavy duty gloves are recommended if the task has a high risk for percutaneous injury (e.g., sorting linen, handling waste).

Gowns, Masks and Eye Protection in Environmental Services

A gown, mask, and eye protection are not required for most routine cleaning activities unless there is a risk of exposure to blood or body fluids. PPE requirements identified on Material Safety Data Sheets (MSDS) should be followed when using chemical agents (e.g., wearing facial protection when mixing chemical agents when there is a risk of splashing). For staff working in laundry facilities, barrier gowns or fluid-resistant aprons and sleeves are worn with a face shield when there may be a risk of splashing.

Removal of PPE

PPE, when worn, should be removed in a manner that will not contaminate the wearer, and should be removed and discarded immediately after the task has been completed. Hand hygiene should be performed after removal of PPE.

3.1.2 Additional Precautions

Additional precautions are IPAC interventions to be used in addition to routine practices to protect staff and patients by interrupting the transmission of specific infectious agents. Patients on additional precautions may be cohorted or placed in single rooms with appropriate signage affixed to the entrance to the room that indicates the PPE required when carrying out activities inside the room. All staff should comply with these precautions when entering the room.

For more information regarding routine practices and additional precautions:

- See *Routine Practices and Additional Precautions in All Health Care Settings* 2nd Revision [64] available at: http://publications.gc.ca/site/eng/440707/publication.html

Recommendations

33. Environmental Services staff should adhere to routine practices and additional precautions when cleaning. [BII]

34. Environmental Services staff should follow best practices for hand hygiene. [AII]

35. ***Personal protective equipment (PPE) should be:***
    - sufficient and accessible for all Environmental Services staff
    - worn as required by routine practices, additional precautions and MSDS when handling chemicals
    - removed immediately after the task for which it is worn. [BII]
36. ***Gloves should be removed and hand hygiene performed on leaving each patient room/environment or bed space. Soiled gloves should not be worn when walking from room to room or to other areas of the healthcare facility. [AIII]***

3.2 Healthcare Setting Cleaning Practices

Cleaning practices are intended to address a number of risks:

- infection transmission to the patient
- occupational health and safety risk for healthcare setting staff
- inconsistency in practice
- poor public image in the opinion of patients, visitors, and staff, due to the general appearance of areas.

Cleaning practices need to be clear and understandable by all staff. They should include task requirements to ensure that there is an understanding of the processes so that defined outcomes can be met.

This best practices document recognizes that health authorities and other healthcare settings may develop protocols that vary in name, types of cleaning and disinfecting solutions, and times when these solutions would be used. For example, there exists a divergence on whether disinfectants should be used at all times for all surfaces in patient care areas.

The determination of what cleaning intensity and frequency is required is driven by potential risk. This is based on an assessment of each area to determine the degree of potential contamination, the degree of exposure and vulnerability of patients and others, and the type of activities that occur. Using these criteria, areas can be stratified into different risk categories (i.e., very high risk, high risk, moderate risk, low risk), which can be used to determine the intensity and frequency of cleaning required for each area.

➢ See **Appendix D,** *Risk Stratification Matrix to Determine Intensity and Frequency of Cleaning,* for an illustration of this process.

3.2.1 Using Cleaning and Disinfectant Products

All chemical cleaning products and disinfectants shall be appropriately labelled, and stored in a manner that eliminates risk of contamination, inhalation, skin contact, or personal injury. Chemicals shall be clearly labelled with Workplace Hazardous Materials Information System (WHMIS) information and an MSDS shall be readily available for each item in case of accidents.[45]

While it is known that both cleaning and disinfecting play a significant role in decreasing the microorganisms present on surfaces, Dettenkoffer [38] notes that there appears to be a trend for hospitals in Europe to use detergents while those in North America use disinfectants. The reasons for

using detergents for routine cleaning were cited by Otter et al (2011)[36] as follows: "liquid disinfectants may damage equipment, especially electronics, and chlorine-containing materials may corrode metals. Disinfectants can potentially harm users, and the discharge of waste biocides in the environment may encourage the development of both biocide and antibiotic resistance and have other, more general environmentally damaging effects." Those areas using a detergent for cleaning in patient care areas tend to have also adopted a colour-coded microfibre cloth system. The literature supports the benefit of using a disinfectant when nosocomial pathogens such as VRE, MRSA, and Acinetobacter species are known to be present.[36] Recent studies have also identified the increased efficacy in decreasing the presence of *C. difficile* spores if a sporicidal disinfectant is used.[66-68]

An automated dispensing system should be used to ensure integrity of dilution ratios and to eliminate the need for decanting. Calibration of the dispensing system should be regularly monitored. If a refillable bottle is filled with a disinfectant solution, it should never be topped up with fresh disinfectant. Always use a clean, dry, appropriately-sized bottle, label the product, and date it. The product should be discarded when past the expiry date to ensure its stability.

When using a disinfectant:

- Thorough cleaning is required for any equipment/device to be disinfected, as organic material may inactivate a disinfectant. This may be accomplished through a two-step process involving a cleaner followed by a disinfectant, but is more commonly accomplished in the healthcare setting through a one-step process using a combined cleaner/disinfectant product. When there is visible soil, a two-step process is required regardless of the product used.
- A hospital-grade disinfectant may be used for equipment that touches intact skin.
- It is important that the disinfectant be used according to the manufacturer's instructions for dilution and contact time.
- It is important to ensure proper dilution of the disinfectant, by frequently changing the disinfectant solution and by not dipping a soiled cloth into the disinfectant solution (i.e., no 'double-dipping'). This minimizes the contamination levels of the disinfectant solution and equipment used for cleaning.
- An established frequency for regular monitoring and maintenance of dispensing equipment is required.
- An established frequency for testing product potency should be in place to ensure the efficacy of the disinfectant over time.

➢ Refer to **Appendix E**, *Advantages and Disadvantages of Hospital-grade Disinfectants and Sporicides Used for Environmental Cleaning*, for disinfectants commonly used in healthcare settings.

Recommendations

37. In all healthcare settings, a regular cleaning regimen should be in place. [BIII]

38. Cleaning schedules should be developed, with frequency and intensity of cleaning reflecting whether surfaces are high-touch or low-touch, the type of activity taking place in the area, and the infection risk associated with it; the vulnerability of the patients housed in the area; and the probability of contamination. [BIII]

39. Cleaning agents and disinfectants shall be labelled with WHMIS information.

40. ***Cleaning agents and disinfectants shall be stored in a safe manner in storage rooms.***
41. ***Automated dispensing systems, which are monitored regularly for accurate calibration, are preferred over manual dilution and mixing. [BIII]***
42. ***Disinfectants should be dispensed into clean, dry, appropriately-sized bottles that are clearly labelled and dated; not topped up; and discarded after the expiry date. [AII]***
43. ***Effective use of a hospital-grade disinfectant includes:***
    - ***application of disinfectant only after visible soil and other impediments to disinfection have been removed***
    - ***use on non-critical equipment***
    - ***following the manufacturer's instructions for dilution and contact times***
    - ***frequently changing disinfectant solution with no 'double-dipping' of cloths into disinfectant***
    - ***appropriate use of personal protective equipment, if required, to prevent exposure to the disinfectant. [BIII]***

3.3 Patient Environment and High-Touch Surfaces

Patients shed microorganisms into the healthcare environment, particularly if they are coughing, sneezing, vomiting, or having diarrhea. Bacteria and viruses may survive for weeks or months on dry surfaces in the patient's environment.[54, 69, 70]

The designation of a patient's environment varies depending upon the nature of the healthcare setting and the cognition and activity status of the patient. For example:

- In acute care, the patient environment is the room or bed space, bathroom, and items and equipment inside the room or bed space.
- In intensive care units (ICUs), the patient environment is the room or bed space, bathroom, and items and equipment inside the room or bed space.
- In the nursery/neonatal setting/infant transport, the patient environment is the isolette or bassinet and all items and equipment outside the isolette/bassinet that is used for the infant.
- In ambulatory care, the patient environment is the immediate vicinity of the examination or treatment table or chair, and waiting areas.
- In long-term care, the resident environment includes the resident's individual environment e.g., bed space, bathroom) and personal mobility devices (e.g., wheelchair, walker).
- In some care environments, e.g., mental health, residential care, paediatrics, the patient environment may be shared space, such as group rooms, dining areas, playrooms, central showers and washrooms.
- In transport environments, the patient environment is the area within 2 metres of the patient including all items and equipment used in his/her care.

3.3.1 Microorganisms in the Patient Environment

Some items in the healthcare environment that have been shown to harbour infectious microorganisms are listed in **Table 1**. Cleaning and disinfection disrupts transmission of these microorganisms from the contaminated environment to patients and healthcare providers. Improving cleaning practices in hospitals and other healthcare settings will contribute towards controlling healthcare-associated infection and associated costs.

Non-critical patient and medical equipment that is within the patient's environment and used between patients (e.g., imaging equipment, electronic monitoring equipment, commode chairs) requires cleaning and disinfection before it is used for another patient. Cleaning processes for equipment dedicated to one patient for the duration of their stay are, however, based on the determination of risk for the unit or area. Equipment that is visibly soiled requires cleaning and disinfection.[10] A system should be in place to clearly identify equipment which has been cleaned.[16]

The process and products used for cleaning and disinfection of surfaces and medical equipment should be compatible with the surfaces/equipment. Most, if not all, environmental surfaces will be adequately cleaned with a detergent or a detergent/disinfectant, depending on the nature of the surface and the type and degree of contamination.

Table 1 – Items Found to Harbour Microorganisms in the Healthcare Environment

Examples of environmental items that have been shown to harbour microorganisms such as MRSA, VRE, *C. difficile*, *A. baumannii*, RSV, influenza virus, and others		
Bed frame[71]	Door handle[72, 73, 78, 81-83]	Pillow/mattress[25, 88, 89]
Bed linen[72]	Electronic thermometer[84, 85]	Privacy Curtains [90]
Bed rail[25, 54, 71-76]	Faucet handle[78]	Sink[77]
Bed[25]	Floor around bed[71]	Stethoscope[91-94]
Bedpan/bedpan cleaner[73]	Hemodialysis machine[78]	Suctioning and resuscitation equipment[85]
Bedside table[76, 77]	Hydrotherapy equipment[86]	Table, staff work table/charting area[95]
Blood pressure cuff[72, 78]	Infusion equipment[72, 77]	Telephone, mobile phones[73, 76, 96, 97]
Call bell[73, 76]	Light switch[73, 81]	Television[81]
Chair[17, 78]	Overbed table[72]	Therapeutic and fluidized bed[24, 98, 99]
Clean gloves that have touched room surfaces only[79]	Patient bathroom[71]	Toilet/commode[73, 76, 81]
	Patient hoist/lift and sling[71]	Tourniquet[100]
Computer keyboard[26-29, 31, 80]	Pen[30]	Ventilator[77]
Couch[78]	Phlebotomy tourniquet[30, 87]	

3.3.2 High-touch Surfaces in Healthcare Settings

A study by Huslage et al[101] quantified the frequency of healthcare provider contact with different room surfaces. It was shown that the highest-touch surfaces were those in the immediate vicinity of the patient (e.g., bed rails, over-bed table, IV pumps, and bed surface).

These high touch surfaces require focused attention in all types of cleans. (See Table 3, Types of Cleans)

- See **Appendix F,** *Examples of High-touch Items and Surfaces in the Healthcare Environment* for an illustration of items and sites that are high-touch and which may exhibit environmental contamination in healthcare settings.

3.4 Designated Responsibility for Cleaning

All healthcare providers have a role in maintaining a clean and safe environment. There is often confusion between direct care providers and ES staff over the allocation of cleaning responsibilities, especially of clinical equipment routinely used in the patient environment.[33] This can result in a whole range of items not being cleaned.[68]

It is important to determine how equipment will be cleaned, by whom, and how often, and

have this identified in written protocols. For new equipment, this should be determined as part of the purchase decision. Given the variation across the province of facility sizes, occupancy rates, and availability of ES staff over the 24 hour period, designation of cleaning responsibilities should be determined on a facility basis.

Consideration should be given to transferring cleaning responsibilities of certain items historically designated to direct care providers, to ES staff.[33] Fluctuating workloads due to the changing acuity of patients' needs impacts the ability of direct care staff to perform these functions. When revising direction on responsibilities for cleaning, it is important to obtain input from point of care staff, as well as managers.[32] Staff, whether direct care providers or ES staff should have sufficient training in cleaning these items as well as the time to perform the task.[33] **Table 2** identifies concepts that should be considered when designating responsibility for cleaning or maintaining medical equipment clean.

Table 2- Considerations for Designating Responsibility for Cleaning

WHO	WHAT	WHEN
Direct care staff	• equipment used between patients • equipment attached to patients (in use) • equipment that is owned or dedicated to their use (e.g., stethoscopes, badges, mobile phones, pagers, etc.)	• between patients • when visibly soiled • after contact with patient (stethoscopes) • after use in patient space (phones, pagers), and at minimum daily
Environmental services staff	• equipment dedicated to the patient (if not attached to patient) • equipment used by patient and in patient environment on discharge • equipment placed in designated areas for soiled equipment	• when soiled, part of the patient environment clean • part of discharge clean • daily, clean equipment is tagged clean and moved to designated clean area
Managers/ Supervisors	• ensure staff have the appropriate training to clean equipment • assess cleaning processes to ensure adherence to protocols	• on hire, with new equipment, as required • at least annually

Everyone using equipment during patient care activities has the responsibility to ensure the cleanliness and functionality of the equipment as an element of safe patient care.

- For additional information on suggested designation of responsibilities, see **Appendix G,** *Recommended Minimum Cleaning and Disinfection Level and Frequency For Non-Critical Patient Care and Equipment and Environmental Items*

3.5 Types of Cleans

The types of cleaning are derived from the determination of the risk to patients housed in an area. Although the terminology used across British Columbia for the different types of cleaning may vary, **Table 3** provides examples of types of clean with their associated risk category and when they should be used. It intends that when a disinfectant is used, there is a two-step process (clean followed by disinfection), unless the disinfectant is a cleaner/disinfectant as stated by the manufacturer. When there is visible soiling, a two-step process is required regardless of the product used.

Table 3- Types of Cleans

TYPE OF CLEANS	RISK CATEGORY	SITUATIONS/AREAS
GENERAL CLEAN	Low Risk	· Basis of all cleaning practices · Cleaning that occurs in all healthcare settings in all non-patient care areas, such as non-sterile supply rooms, administrative offices, waiting areas
ROUTINE DAILY CLEAN	Based upon type of unit (e.g. ICU, transplant) · Moderate Risk · Some High Risk · Some Very High Risk	· Patient is **not** on additional precautions · Cleaning that occurs in all patient rooms/space and bathrooms in all healthcare settings
ROUTINE DISCHARGE CLEAN	Based upon type of unit (e.g. ICU, transplant) · Moderate Risk · Some High Risk · Some Very High Risk	· Patient is **not** on additional precautions · Cleaning that occurs in patient room/space and bathrooms when a patient is discharged or transferred
ADDITIONAL PRECAUTION DAILY CLEAN	High Risk	· Cleaning that occurs in patient room/space and bathrooms when a patient Is on additional precautions (contact, droplet, or airborne) · A disinfectant is used in addition to cleaner, unless using a combined cleaner/disinfectant
ENHANCED DAILY CLEAN	Very High Risk	· Used during an outbreak, or occurs at the request of ICP to prevent an outbreak from occurring · Includes an "additional precaution daily clean" and is followed by a clean and disinfection of high-touch surfaces in patient rooms and bathrooms approximately 6-8 hours later · All high touch areas throughout the unit (inclusive of hallways, nursing station/pod, dirty utility room are cleaned and disinfected twice daily · A disinfectant is used in addition to cleaner, unless using a combined cleaner/disinfectant
ADDITIONAL PRECAUTION DISCHARGE CLEAN	High Risk Very High Risk	· Occurs when patient is discharged, transferred to another room/unit or additional precautions have been discontinued. · Cleaning that occurs in patient rooms/spaces and bathrooms when a patient is on additional precautions (contact, droplet or airborne), or when enhanced daily cleaning in place · Includes a privacy curtain change · A disinfectant is used in addition to cleaner, unless using a combined cleaner/disinfectant
ADDITIONAL PRECAUTION DAILY CLEAN WITH SPORICIDAL	Very High Risk	· Used for cases of *C. difficile* (suspected or known) and for any other organism requiring a sporicidal for kill · Includes an "additional precaution daily clean" and is followed by a clean and disinfection of high-touch surfaces in patient rooms and bathrooms approximately 6-8 hours later · A sporicidal disinfectant is used in addition to a cleaner

TYPE OF CLEANS	RISK CATEGORY	SITUATIONS/AREAS
ADDITIONAL PRECAUTION DISCHARGE CLEAN WITH SPORICIDAL	Very High Risk	▪ Occurs when a patient or unit/area is on "additional precautions daily cleaning with sporicidal" ▪ Occurs when patient is discharged, transferred to another room/unit, or additional precautions have been discontinued ▪ Includes a privacy curtain change ▪ A sporicidal disinfecting solution is used in addition to a cleaner
SCHEDULED CLEAN	Low Risk	▪ Encompasses the cleaning of environmental items that are not included in the daily cleans (routine or discharge). ▪ This cleaning is managed on a cyclical basis. ▪ This includes but is not limited to items such as ceilings, vents, windows, clean supply rooms, etc.

3.5.1 General Clean Practices

General clean practices are used wherever cleaning is done. It provides a measure of cleanliness based on the visual appearance that includes dust and dirt removal, waste disposal, and cleaning of windows and surfaces.

- See **Appendix H** *Examples of Protocols for Cleans:* **H-1** *General Cleaning for all Healthcare Settings* for an example of the steps to take for this type of clean.

3.5.2 Routine Daily Clean

Routine daily cleans are performed in all environments where patient care is provided and the patient is not on additional precautions. Frequency and intensity are dependent on the risk category for the area. Regular monitoring and auditing of practices by a supervisor during or following the cleaning procedure is required.

3.5.2.1 Patient Environment/Bed Space

Cleaning of patient environment/bed space should follow a methodical, planned format. Rooms should be minimally stocked with supplies (i.e., what is required for a 24-hour period).

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-2** Routine *Daily Clean of Patient Environment/Bed Space* for an example of the steps to take for this type of clean.

In addition to routine daily clean of patient environments/bed space, the following scheduled clean should be implemented:

- high dusting in room (e.g., weekly)
- baseboard and corners (e.g., weekly)
- removal and laundering privacy curtains (e.g., when soiled; at discharge if patient is on additional precautions; at discharge/death of patient in long term care/residential care; and at least quarterly)
- window curtains/coverings when soiled and at least annually
- window blinds dusted at least monthly.

Frequency for scheduled cleaning of the bed space and environment for patients remaining in acute care for extended periods of time (i.e., acute, alternate level of care, long term care) will be determined

on a case-by-case basis, coordinated by the direct care staff and in consultation with IPAC.

High dusting includes all horizontal surfaces and fixtures above shoulder height, including vents. Ideally, the patient should be out of the room during high dusting to reduce the risk of inhaling spores from dust particles. To perform high dusting,

- prevent dissemination of dust (e.g., use HEPA or micron-filtered vacuums, damp mop/dusters)
- proceed either clockwise or counter clockwise from the starting point, to avoid missing any surfaces
- note and report stained or misplaced ceiling tiles, fixtures, or walls so they can be replaced or repaired.

3.5.2.2 Patient Bathroom

Bathrooms should be cleaned last, after completing the room. Shower walls should be thoroughly scrubbed at least weekly. Shower curtains should be changed when soiled; at discharge if patient is on additional precautions; at discharge/death of patient in long term care/residential care; and at least quarterly.

Equipment used to clean toilets (e.g., toilet brushes, toilet swabs) should not be carried from room to room. Toilet brushes/swabs should be discarded when they are damaged, stained, or worn. They are also discarded after cleaning a room where the patient(s) is on additional precautions.

High Traffic/Public Bathrooms

Bathrooms located in high traffic areas (e.g., emergency room/urgent care centre bathrooms) that may frequently become contaminated, particularly with *C. difficile* and enteric viruses such as norovirus, should be:

- be cleaned and disinfected **at least** twice daily
- preferably be disinfected with a sporicidal agent
- be inspected every four hours and re-cleaned if necessary.

➢ See **Appendix H,** *Examples of Protocols for Cleans:* **H-3** *Routine Daily Clean of Patient Bathroom* for an example of the steps to take for this type of clean.

3.5.2.3 Floor in Patient Care Areas

Floors in healthcare settings may be comprised of a number of materials. It is important to review the manufacturer's recommendations for cleaning a particular type of flooring before developing cleaning protocols.

Floor Care

Floor cleaning consists of dry dust mopping to remove dust and debris, followed by wet mopping with a detergent. The issue of whether or not to use a disinfectant in the routine mopping of floors in healthcare settings is unresolved.[37, 102-105] Under normal circumstances, the use of a disinfectant is not required. The floor in a multi-patient room is cleaned after all bed spaces and the bathroom are cleaned.

There are currently two methods for wet mopping floors:

- bucket and loop mop (traditional method)
- microfibre mop.

Dry mopping is done to collect dust and debris from the floor to prepare it for wet mopping. Dry mopping may be done with dry mops, microfibre mops or pads, to reduce dispersal of dust and debris. The mop or pad should be changed when soiled and at minimum after every four rooms. It is changed after every room where a patient is on precautions.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-4** *Sample Procedure for Mopping Floors Using Dry Dust Mops,* **J-5** *Sample Procedure for Mopping Floors Using Wet Loop Mop and Bucket,* **J-6** *Sample Procedure for Mopping Floors Using a Microfibre Mop.*

Carpet Care

Carpets should be discouraged in patient care areas. If, however, carpeting is being used, it should include a rigorous program of care that includes:

- daily vacuuming with a HEPA-filtered or micron filter vacuum
- scheduled extraction/shampooing
- rapid response for dealing with spills of blood and body fluids.

Considerations for the care of carpeting in general areas should include: [16]

- vacuuming with a HEPA-filtered or micron vacuum
- diffusion of the expelled air from vacuum cleaners so that it does not aerosolize dust from uncleaned surfaces
- a method for routine cleaning and extraction/shampooing.

Extraction/shampooing of carpet may be done on a regular basis to remove soils, dust, and other debris (e.g., bonnet cleaning), or as required in the event of heavy soiling or a spill (e.g., steam cleaning).

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-7** *Care of Carpets*

3.5.2.4 Cleaning Equipment

Cleaning equipment also requires attention to avoid cross-transmission of microorganisms and proliferation of microorganisms in the patient care environment:

- cleaning equipment should be well maintained, clean and in good repair
- tools and equipment used for cleaning and disinfection should be cleaned and dried between uses (e.g., mops, buckets, rags)
- mop heads and microfiber cloths should be laundered daily, and dried thoroughly before storage
- cleaning carts should:
  - have a separation between clean and soiled items
  - never contain personal clothing or grooming supplies, food or beverages
  - be thoroughly cleaned at the end of the day
  - be stored in a designated location, preferably in the environmental services storage room

Cleaning carts should be equipped with a locked compartment for storage of hazardous substances. In areas where patients may place themselves at risk by accessing the items or solutions on the cart, the cart should be locked at all times when not attended.[105] When in use, cleaning carts should be placed so that there is space to prevent any inadvertent splash onto clean items or supplies.

3.5.3 Routine Discharge Clean

When a patient is discharged, transferred, or dies, the room or bed space requires thorough cleaning

before the next patient occupies the space. Responsibilities of direct care providers include:

- removal or discarding of medical supplies
- emptying suction bottles, discarding IV bags and tubing, discarding urinary catheter collection bags, emptying bedpans/commodes/urinals/washbasins
- removal of oxygen therapy equipment
- disposal of personal articles left by the patient.

Personal care items should not be shared between patients, as this can result in transmission of microorganisms to other patients and healthcare providers.[106] Examples of personal care items include lotions and creams, razors, nail care equipment, and toys. When the patient is discharged or transferred, their personal items should be taken with them or discarded.

Once direct care providers have completed their tasks, routine discharge cleaning can take place by ES.

Medical equipment used by the patient will remain within the room/bed space until it has been cleaned. Once cleaned, the equipment should be tagged "clean" and stored in the appropriate designated "clean" area or returned to the equipment depot.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-8** *Sample Procedure for Routine Discharge Cleaning of Patient Room*

3.5.4 Additional Precaution Daily Clean (Contact, Droplet, Airborne Precautions)

Stringent protocols are required for the daily cleaning and disinfection of rooms/cubicles/space where patients are on additional precautions. Personal protective equipment (PPE) is required. Sufficient time should be allowed for cleaning and disinfection of rooms of patients on additional precautions.

Rooms where patients require additional precautions should be minimally stocked with supplies. All ES staff should note the sign outside the room or bed space designating the PPE required, and put on prior to entering the room/bed space. ES staff entering a room where the patient is on airborne precautions shall wear a fit-tested and seal-checked N95 respirator. The door should be kept closed to maintain negative pressure, even if the patient is not in the room.

For Additional Precaution Daily Cleans, a disinfectant is always used. This can be a two-step process with disinfection occurring after the area is cleaned with a cleaning detergent; or it can be done as one step using a recognized combined cleaner/disinfectant. If there is visible soiling, then a two-step process is required regardless of the product used. The solution and mop head should be changed after completing the room or bed space requiring the Addition Precaution Daily Clean. Because some microorganisms survive in the environment, attention should be paid to high-touch items in the room as well as all items within the immediate vicinity of the patient.

PPE should be removed, placed in the waste bin, and hands cleaned before moving to another room, bed space, or task.

This type of clean is **not** used for *C. difficile* or any other organism requiring a sporicidal disinfectant for kill, (see Additional Precaution Daily Clean with Sporicidal).

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-9** *Sample Procedure for Additional Precaution Clean of Patient Room*

3.5.5 Enhanced Daily Clean

Enhanced Daily Clean may be requested by the ICP as a preventative measure to decrease the bioburden of the organism(s). Enhanced Daily Cleans may be requested during an outbreak, when there is a cluster of patients with similar symptoms that suggest infection or when a unit or department (i.e. emergency) has been at an over-census capacity for a number of days and there are numerous patients exhibiting various infectious signs and symptoms.

The particular feature of this clean is that it occurs **twice** during the day. The first clean and disinfection is achieved through the Additional Precaution Daily Clean, with the subsequent clean and disinfection occurring approximately 6-8 hours after the first and focusing on the high touch areas in the patient room/bed space and bathroom. All high touch areas throughout the care unit/department (inclusive of hallways, nursing station/pod, dirty utility room) are also cleaned and disinfected twice daily. The Enhanced Daily Clean requires the use of a disinfectant, either as a two-step process or using a recognized combined cleaner/disinfectant. If there is visible soiling, then a two-step process is required regardless of the product used. Personal protective equipment (PPE) is required. A product change may be requested by IPAC to include a disinfectant known to target the suspected or confirmed pathogen during outbreaks (i.e., virucide).

This type of clean is **not** used for *C. difficile* or any other organism requiring a sporicidal disinfectant for kill, (see Additional Precaution Daily Clean with Sporicidal).

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-10** *Sample Procedure for Enhanced Daily Clean of Patient Room*

3.5.6 Additional Precaution Discharge Clean

This type of clean is used when a room or bed space is being cleaned on a daily basis following the "Additional Precaution Daily Clean" or "Enhanced Daily Clean", and a patient is discharged, transferred, dies, or has additional precautions discontinued. The room or bed space should be cleaned thoroughly before the next patient occupies the space.

Responsibilities of direct care providers include:

- removal or discarding of medical supplies
- emptying suction bottles, discarding IV bags and tubing, discarding urinary catheter collection bags, emptying bedpans/commodes/urinals/washbasins
- removal of oxygen therapy equipment
- disposal of personal articles left by the patient.

The precaution sign is left posted until the discharge clean has been completed.

This type of clean is **not** used for *C. difficile* or any other organism requiring a sporicidal disinfectant for kill, (see Additional Precaution Discharge Clean with Sporicidal). A product change may be requested by IPAC to include a disinfectant known to target the suspected or confirmed pathogen during outbreaks (i.e., virucide)

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-11** *Sample Procedure for Additional Precaution Discharge Clean of Patient Room*

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-12** *Sample Procedure for Additional*

Precaution Clean of Patient Room when additional precautions are discontinued

3.5.6.1 Airborne Precautions

The following additional measures should be taken when patients are on airborne precautions:

- Consult with FMO for the specific air changes of the negative pressure room, and ideally have the time required for decontamination posted by the room
- Keep the doors closed following patient transfer or discharge, and while the room is being cleaned
- Remove N95 respirator only after leaving room and door has been closed
- Notify nursing staff when room cleaning has been completed
- Remove the airborne precautions sign and open the door **only when** sufficient time has elapsed to allow the removal of airborne microorganisms (dependent on air changes per hour)

Table 4 - Air Changes Per Hour and Time Required to Remove Airborne Contaminants

Air changes per hour and time required for airborne contaminant at efficiency of 99%	
Air Changes Per Hour	**Time (minutes) Required for Removal**
2	138
4	69
6	46
8	35
10	28
12	23
15	18
20	14
Shaded lines identify the most common air changes in patient care areas	
Adapted from: PHAC's Tuberculosis Prevention and Control and the Canadian Lung Association/Canadian Thoracic Society's Canadian Tuberculosis Standards[16, 107]	

3.5.7 Additional Precaution Daily Clean With Sporicidal

This type of clean is requested by ICP or direct care staff based on established IPAC protocols for cases of *C. difficile* (suspected or known), and for any other organism that may require a sporicidal disinfectant for kill. The cleaning and disinfection protocol is the same as for Enhanced Daily Clean in that it occurs **twice** daily, with the second clean and disinfection occurring approximately 6–8 hours after the first, and focusing on the high touch areas in the patient room/bed space and bathroom. The special feature of this clean is that a recognized sporicidal disinfectant is used.

It should be noted that the use of sporicidal agents alone is not effective in reducing environmental contamination with *C. difficile*. Physical cleaning of surfaces (using friction on surfaces) is required in order to reduce the bioburden.[108] If a sodium hypochlorite solution is used as the sporicidal agent, a pre-cleaning step using a detergent cleaner is required to remove soil. If a recognized combined cleaner/sporicidal disinfectant is used, one step incorporating friction is acceptable. If there is visible soiling, then a two-step process is required regardless of the product used.

➢ See **Appendix H,** *Examples of Protocols for Cleans:* **H-13** *Sample Procedure for Additional*

Precaution Daily Clean with Sporicidal of Patient Room

3.5.7.1 *Clostridium difficile* (*C. difficile*)

C. difficile is a spore-forming bacterium which is readily killed with hospital-grade disinfectants when in its vegetative state, but the spores can persist in the environment for months.[109] The spores can be spread by contact and germinate once ingested. Control is facilitated through thorough cleaning and disinfection of the patient environment.

C. difficile spores are only killed by sporicidal agents. Factors influencing the efficacy of the products as well as the **proper dilution and contact times set out by the manufacturer** should be taken into consideration. The following chemical agents have demonstrated some efficacy against *C. difficile* spores:

- sodium hypochlorite (1,000-5,000ppm)[66, 110-112]
- hydrogen peroxide enhanced action formulation (HP-EAF) (4.5%) [113]
- peracetic acid (0.26%).[114]

Table 5 - Dilution of Household Bleach to Achieve Most Common Desired Chlorine Levels

Dilution*	Preparation	Level of available chlorine	
		% chlorine	#ppm
1:50	1 part bleach + 49 parts water	0.1%	1,000 ppm
1:10	1 part bleach + 9 parts water	0.5%	5,000 ppm
* Dilution of household bleach containing 5% sodium hypochlorite with 50,000 parts per million (ppm) available chlorine			

Environmental contamination with *C. difficile* is most concentrated in the patient's room [76] and bathroom,[115] making these areas the focus of stringent cleaning methods.

As per the *C. difficile* trigger tool, if a trigger event has been identified (e.g. there is a higher level of cases of *C. difficile* on a unit/ward or attributable to a unit/ward as identified through the *C. difficile* Trigger Tool [43], an outbreak on the unit, or the actions taken have not decreased transmission), then an escalation process for cleaning protocols should be considered in consultation with the ICP. In all Instances, the Additional Precaution Daily Clean With Sporicidal is followed. [116]

1. Clean and disinfect all high-touch surfaces throughout the unit.
2. Clean and disinfect all equipment on the unit (review the manufacturer's guide for compatibility with the cleaner/sporicidal agent).
3. Clean and disinfect patient rooms/bed spaces and bathrooms on other units that have a close association, such as transfer patterns (e.g. emergency, ICU) to units with high incidence of *C. difficile*. A sporicidal disinfectant is used.
4. When each patient is discharged or transferred from these associated units, clean and disinfect their room/bed space. A sporicidal disinfectant is used.
5. Steps (1-4) should be performed for 1-2 weeks (time dependent on advice of IPAC),
6. Then scale back to the inpatient rooms and bathrooms only on units that continue to have a high incidence of cases. Continue this approach until the incidence decreases,
7. Then scale back to only patient rooms and bathrooms where the patient is known or suspected to have *C. difficile.*

If a particular room is identified epidemiologically as having a high transmission rate between patients, a double cleaning process at time of recognition and at discharge of patients should be considered. This involves a clean and disinfection of the room using a cleaner and sporicidal agent, followed by a second clean and disinfection once the surfaces have dried.

If the number of either nosocomial or community cases rises on a unit to the point where the IPAC feels there is a high burden of disease, the unit should move back to step 6, scaling back once the number of cases has again decreased.

- See *British Columbia Clostridium Difficile Infection Toolkit and Clinical Management Algorithm (2012)*,[43] available at: http://s.picnet.ca/CDItoolkit.

3.5.8 Additional Precaution Discharge Clean With Sporicidal

This type of clean is used when a room or bed space is being cleaned daily using the Additional Precaution Daily Clean With Sporicidal, and a patient is discharged, transferred, or dies. It is also performed when a patient has additional precautions discontinued. There may be other situations where this type of clean is requested, and would be at the discretion and determination of IPAC.

The cleaning protocol for the Additional Precaution Discharge Clean With Sporicidal is the same as that for the Additional Precaution Discharge Clean, except that it requires the use of a sporicidal agent. It follows a two-step process of cleaning using a cleaning detergent followed by a sporicidal disinfectant or uses a recognized combined cleaner/sporicidal disinfectant. If there is visible soiling, then a two-step process is required regardless of the product used.

This type of clean is used for *C. difficile* or any other organism requiring a sporicidal disinfectant for kill.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-14** *Sample Procedure for Additional Precaution Daily Clean with Sporicidal of Patient Room*
- See **Appendix I**, *Sample Environmental Cleaning Checklists and Observation Tools*, for a sample Checklist for: *Additional Precaution Discharge Clean with Sporicidal for C. difficile patient room*.

3.5.9 Scheduled Cleans

This type of clean is managed on a cyclical basis, and encompasses those items and areas that are not included in the daily routine or discharge cleans. This includes but is not limited to items such as ceilings, vents, windows, clean supply rooms, etc.

Recommendations

44. All healthcare facilities should develop policies and procedures that include:

- ***procedures for cleaning and disinfection that incorporate infection prevention and control principles***
- ***defined responsibility for specific items and areas***
- ***clearly defined lines of accountability***
- ***cleaning standards for intensity and frequency***
- ***procedures for daily and discharge cleaning and disinfection***
- ***procedures for cleaning and disinfecting areas for the daily and discharge cleaning of rooms of patients on additional precautions, inclusive of escalation processes, especially***

for environmentally-hardy organisms such as C. difficile [BII]
- ***procedures for outbreak management***
- ***procedures for cleaning in construction/renovation areas [AII]***

45. Equipment used to clean toilets:

- ***should be discarded when damaged, stained, or worn***
- ***should be discarded after cleaning a room where patient(s) is on precautions***
- ***should minimize splashing [BIII]***

46. Bathrooms located in high traffic areas should:

- ***be cleaned at least twice daily***
- ***preferably be disinfected with a sporicidal agent***
- ***be inspected every four hours and re-cleaned if necessary. [AII]***

47. Environmental services cleaning carts should have a clear separation between clean and soiled items, should never contain personal items, and should be thoroughly cleaned at the end of the day. [BII]

48. Equipment that is used for cleaning and disinfecting should itself be cleaned and disinfected according to recommended standards for intensity and frequency. [BII]

49. Cleaning and disinfection equipment should be well maintained, in good repair and be cleaned and dried between uses. [BII]

50. Mop heads and microfibre cloths should be laundered daily, and dried thoroughly before storage. [BII]

3.5.10 Cleaning Spills of Blood and Body Substances

Spills of blood and other body substances such as urine, faeces, and emesis should be contained, cleaned, and the area disinfected immediately. The healthcare setting shall have written policies and procedures for dealing with biological spills that include: [6, 41, 50, 117]

- clearly defined assignment of responsibility for cleaning the spill in each area of the healthcare setting during all hours when a biological spill might occur
- provision for timely response
- a method for the containment and isolation of the spill
- training of staff who will clean the spill
- access to PPE, equipment, supplies, waste and linen disposal for staff who will clean the spill;
- proper disposal of waste
- procedure to be followed if there is a staff exposure to biological material
- section in Exposure Control Plan for blood and body fluids
- documentation of the spill incident.

➢ See **Appendix H,** *Examples of Protocols for Cleans:* **H-15** *Sample Procedure for Cleaning a Blood or Body Fluid Spill*

➢ See **Appendix H,** *Examples of Protocols for Cleans:* **H-16** *Sample Procedure for Cleaning a Blood or Body Fluid Spill on Carpet*

Recommendations

51. Healthcare settings shall have written policies and procedures dealing with spills of blood and other body fluids.

3.6 Equipment and Specialized Item Cleaning

Non-critical patient and medical equipment that is within the patient's environment and used between patients (e.g., imaging equipment, electronic monitoring equipment, commode chairs) requires cleaning and disinfection before it is used for another patient. Cleaning processes for equipment dedicated to one patient for the duration of their stay are, however, based on the determination of risk for the unit or area. The minimum intensity (clean or LLD) will be dependent on the risk category for the area, with a basic premise that any item that is used between patients should be cleaned and disinfected between patients, and cleaning and disinfection is always required after use when a patient is on additional precautions. The manufacturer's recommendations for the cleaning solution and contact time for the product being used should be closely followed. A system should be in place to clearly identify equipment that is clean and ready for use.

- Refer to **Appendix G**, *Recommended Minimum Cleaning and Disinfection Level and Frequency for Non-critical Patient Care Equipment and Environmental Items* for suggested level of intensity and frequency.

Recommendations

52. Non-critical medical equipment within the patient's environment and used between patients requires cleaning and disinfection between each patient use. [AII]

53. Each healthcare setting should have written policies and procedures for the appropriate cleaning of non-critical medical equipment that clearly defines the frequency and intensity, and assigns responsibility for the cleaning. [BIII]

3.6.1 Cloth Furnishings

Upholstery and cloth furnishings should be vacuumed regularly and steam cleaned as necessary when stained or visibly soiled. Refer to the manufacturer's recommendations for cleaning upholstered furnishings. There should be a plan in place to replace cloth furnishings with cleanable furnishings. Replace cloth furnishings that are torn or damaged.

3.6.2 Commodes

Commodes should be dedicated to the patient for the duration of their stay. Cleaning of commodes should occur on a daily basis as part of the patient room/bed space clean, when visibly soiled, and on discharge. If a commode is used between patients, it should be cleaned and disinfected before it is used for the subsequent patient. Commodes should also be thoroughly cleaned on a regularly scheduled basis; this may be done manually or through an automatic commode/wheelchair washer. When cleaned, they should be tagged as clean and stored in the designated clean area.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-17** *Sample Procedure for Cleaning Commodes*

3.6.3 Electronic Equipment

Electronic equipment in the healthcare setting includes infusion pumps, ventilators, patient-controlled analgesia pumps, telemetry receivers and transmitters, infusion fluid warmers, infant sensors, monitoring equipment, handheld devices and keyboards. Inappropriate use of liquids on electronic medical equipment may result in fires and other damage, equipment malfunctions and healthcare provider burns. Equipment malfunctions could result in life-threatening events to patients such as over-infusion of medications and loss of life-supporting interventions.[118]

When selecting electronic equipment, it is important that it be compatible with the cleaning and disinfecting agents used in the healthcare setting, and that the manufacturer's recommendations for cleaning are followed.

To avoid hazards:

- obtain the manufacturer's labelling which may include instructions for cleaning and disinfection; information may be available on the manufacturer's website
- review labelling for any cautions, precautions, or warnings about wetting, immersing, or soaking the equipment
- review the manufacturer's cleaning and maintenance instructions and ensure all staff who will be cleaning the item are trained
- protect equipment from contamination whenever possible:
    - position equipment to avoid contact with anticipated splatter
    - avoid laying contaminated items on unprotected equipment surfaces
    - use barriers on equipment surfaces that you expect to touch with contaminated hands or when contact with splatter cannot be avoided (e.g., keyboard skins)
    - all healthcare providers should do appropriate hand hygiene prior to use of electronic equipment
- if equipment is contaminated with blood or other potentially infectious material, follow the equipment manufacturer's directions for cleaning to remove as much soil as possible; it may be necessary to remove the equipment from service for thorough cleaning and disinfection or replacement if necessary.

3.6.4 Hydrotherapy Equipment

Hot tubs, spas, and physiotherapy pools have been associated with the acquisition of infection.[119-121] Skin and wound infections may result from direct contact of intact skin or wounds to contaminated water. Inhalation of microorganisms in aerosolized water (e.g., whirlpools) has resulted in respiratory infections.

Cleaning of hydrotherapy equipment should follow the manufacturer's instructions with regard to frequency and type of products that may be used for cleaning and disinfection. Cleaning and disinfection should be scheduled and the schedule strictly adhered to and documented.

3.6.5 Ice Machines

Bacteria have been isolated from ice, ice-storage chests, and ice-making machines.[122, 123] Microorganisms in ice can contaminate clinical specimens and medical solutions that require ice for transport or holding. Ice may become contaminated if the water source for the ice is contaminated and from contaminated hands touching the ice.

To minimize contamination, ice machines that dispense ice directly into a container are recommended. Ice machines requiring scoops are not recommended. If used, there should be a plan for replacement.

If older machines have not yet been replaced:

- provide a scoop for dispensing the ice
- do not store the ice scoop loose in the ice machine
- provide a holder for the ice scoop
- ice scoop should be cleaned and disinfected at least once a day, and more often if necessary
- restrict access to machines during outbreak situations.

Ice machines and ice chests should be cleaned at least quarterly, including cleaning, de-scaling and disinfection. Clean ice machines following the manufacturer's instructions.

➢ See **Appendix H,** *Examples of Protocols for Cleans:* **H-18** *Sample Procedure for Cleaning Ice Machines*

3.6.6 Toys/Playrooms/Activity Rooms

Toys can be a reservoir for potentially pathogenic microorganisms that can be present in saliva, respiratory secretions, feces, or other body substances.[81, 124-127] Outbreaks associated with toys have been described.[128]

Playrooms or play areas that are used by more than one child should have an area for segregation of used toys (e.g., a bin into which children/parents/staff can place used toys and is clearly marked as "soiled/used toys"). Clean toys should be stored in a manner that prevents contamination (e.g., dust and water splatter) and should be clearly marked as clean. Toy storage boxes/cupboards should be emptied and cleaned weekly or when visibly soiled. Toys should:[129]

- be smooth, non-porous and able to withstand rigorous mechanical cleaning
- not retain water (e.g., bath toys)
- have parts that can be cleaned
- not be cleaned with phenolics.

All toys should be cleaned and disinfected between users. If a toy cannot be cleaned (e.g., plush toys), it should be dedicated to an individual patient and be sent home or discarded when the patient is discharged.

Responsibility for cleaning toys should be assigned (e.g., ES staff, Child Life staff, Audiology staff) and written procedures regarding frequency and methods of cleaning are required. Toys should be removed from general waiting rooms if an adequate process cannot be established to ensure their daily inspection, cleaning and disinfection. Staff assigned to cleaning and disinfecting toys should be trained in effective cleaning procedures.

The procedure for cleaning and disinfecting toys should include:

- inspection for damage, cracked or broken parts
- cleaning according to the manufacturer's instructions or local practices (e.g., in hot water with detergent)
- cleaning in a washer that is not used for cleaning bedpans and urinals
- options for disinfection:
  - a commercial dishwasher/cart washer cycle with a sanitizing cycle

  - hospital-grade, approved low-level disinfectant, following the manufacturer's recommendations regarding dilution and contact times
  - 70% alcohol solution
  - 1/100 dilution of sodium hypochlorite (bleach)
- thorough rinse following disinfection
- air-drying prior to storage

➢ See **Appendix H,** *Examples of Protocols for Cleans:* **H-19** *Sample Procedure for Cleaning Toys*

Adult activity rooms and items used for activities should be spot cleaned daily. In addition to general cleaning practices, the following is strongly recommended:

- encourage hand hygiene before and after activity
- clean activity items and storage areas on a scheduled basis
- regularly assess items that cannot be easily cleaned and discard if soiled

Carts that take books and magazines to patients on units should be spot cleaned daily and when soiled. They should not be taken into patient bed spaces or rooms where additional precautions are in place, or onto units with outbreaks.

Children or adults on additional precautions should have dedicated toys, books, magazines, and puzzles, which should be discarded on discharge.

3.6.7 Transport Equipment

Transport equipment (e.g., stretchers, wheelchairs, walkers) used for more than one patient should be cleaned and disinfected immediately after use and when visibly soiled, paying particular attention to high-touch areas (e.g., rails, push handles, chair arms). Once cleaned and disinfected, equipment should be tagged as clean.[130]

In addition, all transport equipment should be cleaned in accordance with the healthcare setting's written regularly scheduled cleans. Responsibility for cleaning transport equipment should be clearly designated (e.g., transport staff, ES staff).

Equipment dedicated to or the personal property of a patient (e.g., walkers, wheelchairs) should be immediately cleaned and disinfected when soiled or visibly contaminated with blood or body fluids, upon discharge if facility owned, as well as routinely following a written schedule.

3.6.8 Washer/Disinfectors

Some areas have installed washer/disinfectors in patient rooms, or more commonly in dirty utility rooms in patient care areas, to clean patient equipment such as washbasins, bedpans or pots, and urinals. Typically, the washer/disinfectors are used for two purposes: 1) to clean/disinfect equipment after patient use (i.e., bedpans, urinals); and 2) to clean/disinfect equipment after patient discharge.
If the equipment in use is an older model, it may only have the capacity to flush and clean equipment. These devices can only be used for cleaning dedicated patient equipment. They cannot be used for equipment that will be used for subsequent patients. Other processes for disinfection (i.e., disinfectant wipes, or sending to Medical Device Reprocessing Departments (MDRD), will need to be considered. Review manufacturer's instructions for use and settings to determine if a disinfection cycle can be achieved and standards are met by using the washer/disinfector for reprocessing equipment between patients.

Washer/disinfectors should be inspected and cleaned on a daily basis, and undergo preventative maintenance by FMO on a quarterly basis. Responsibility for daily cleaning needs to be clearly identified (i.e., unit aides, IPC aides, ES staff).

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-20** *Sample Procedure for Cleaning Washer/Disinfectors*

Recommendations

54. ***Areas that have toys should have policies and procedures for cleaning the toys. [AII]***
55. ***All equipment used to clean and disinfect non-critical equipment should also be cleaned regularly and undergo scheduled preventive maintenance. [BIII]***

3.7 Cleaning in Specific Settings

3.7.1 Hemodialysis Centres

The patient's hemodialysis station is comprised of the bed or dialysis chair, table, and dialysis machine with its components. Any item taken into a hemodialysis station could become contaminated with blood or other body fluids, and serve as a vehicle of transmission to other patients either directly or by contamination via the hands of staff.

Each hemodialysis station should be treated as an individual entity, and hand hygiene should be performed on entry to the station and at exit from the station, before doing other tasks in the unit.

Items taken to a patient's hemodialysis station, including those placed on top of dialysis machines, should either be disposed of, dedicated for use only on a single patient, or cleaned and disinfected before being returned to a common clean area or used for other patients. Unused medications or supplies taken to the patient's station should not be returned to a common clean area or used on other patients.[131]

The external surfaces of the hemodialysis machine and its components are the most likely sources for contamination with blood-borne viruses and pathogenic bacteria. This includes not only frequently touched surfaces such as the control panel, but also attached waste containers, blood tubing, and items placed on top of machines (e.g., patient chart).[131]

Blood contaminated waste generated by the hemodialysis facility should be handled as biomedical waste. All disposable items should be placed in bags thick enough to prevent leakage.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-21** *Sample Procedure for Cleaning in the Hemodialysis Unit*

3.7.2 Laboratories

Clinical laboratories in British Columbia should follow the Public Health Agency of Canada's Laboratory Biosafety Guidelines (2004)[132] recommendations regarding environmental cleanliness in the laboratory

(available at: http://www.phac-aspc.gc.ca/ols-bsl/lbg-ldmbl/index-eng.php).

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-22** *Sample Procedure for Cleaning Laboratories*

3.7.3 Nurseries and Neonatal Intensive Care Units (NICU)

Routine daily cleaning in nurseries and neonatal intensive care units (NICU) should be performed following the same procedures as for adult patient rooms. The isolette/incubator/bassinet and equipment in the immediate vicinity associated with the infant are considered to be the patient's environment. Products used for cleaning and disinfecting in nurseries and NICU should not be toxic to infants (e.g., phenolics should not be used).

Milk preparation areas may become contaminated and should be cleaned by ES daily and cleaned by milk preparation staff between mothers. Refrigerators and freezers used for milk storage should be equipped with a thermometer to ensure safe storage, and be cleaned on a regular weekly basis. These refrigerators and freezers should be used solely for the storage of milk and not for other items, such as food, specimens or medications.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-23** *Sample Procedure for Cleaning Nurseries and Neonatal Intensive Care Units*

3.7.4 Surgical and Sterile Areas

Environmental cleaning in surgical settings minimizes patients' and healthcare providers' exposure to potentially infectious microorganisms. The Operating Room Nurses Association of Canada (ORNAC) has published standards for environmental cleaning in surgical settings that include:[133]

- ultimate responsibility for ensuring a clean surgical environment rests with the perioperative Registered Nurse
- environmental cleaning should be performed by trained staff according to the protocol of the healthcare setting
- regular cleaning schedule should be established, posted and documented.

Sufficient time for cleaning should be factored into scheduling cases. Equipment from other areas, such as x-ray machines and compressed gas tanks, should be damp-dusted before being brought into the operating room and prior to leaving. Responsibility for damp dusting equipment from other areas, and cleaning anaesthetic machines and carts, should be clearly defined.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-24** *Sample Procedure for Cleaning Operating Rooms Between Cases.* [based on ORNAC standards]
- See **Appendix H,** *Examples of Protocols for Cleans:* **H-25** *Sample Procedure for Terminal Cleaning of Operating Rooms (End of Day)* [based on ORNAC standards]

3.7.5 Medical Device Reprocessing Departments (MDRD, also known as CPS or SPD)

Sterile processing areas in medical device reprocessing departments and other areas that store sterile supplies require daily cleaning.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-26** *Sample Procedure for Cleaning Medical Device Reprocessing Departments and Other Sterile Supply Areas* [based on the Canadian Standards Association's standard Z314.3-09, *Effective Sterilization in Health Care Facilities by the*

Steam Process. [134]

3.7.6 Transport Vehicles

Vehicles that transport patients requiring monitored and critical care (e.g., ambulances) should be cleaned, disinfected, and restocked after each patient transport; on a daily basis; if exposed to heavy contamination; and on a regularly scheduled basis that involves a thorough cleaning and disinfection of all areas.[135] Equipment used in these vehicles (e.g., stretchers, blood pressure cuffs, glucometers, kits, etc.) should be cleaned and disinfected in conjunction with the vehicle.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-27** *Sample Procedure for Cleaning Transport Vehicles*

Vehicles, buses, or vans used to transport patients on activities (i.e., residential care facility vans) or to medical appointments should be spot cleaned when visibly soiled and on a regularly scheduled basis based on the determined risk category. If a patient requires a stretcher for transport, the stretcher (rails, mattress, and pillow) should be cleaned and disinfected following use. Blood and body fluid spillage procedures should be followed for any blood, emesis, or incontinence soil.

Transport and cleaning processes should be developed by each facility in conjunction with IPAC and PH for vehicles that are used for multiple purposes (i.e., transporting supplies, food or waste). Vehicles used to transport food shall not be used to transport waste.[135-137]

Recommendations

56. Healthcare settings should have policies and procedures for cleaning specialized areas, such as hemodialysis units, operating room suites and laboratories. [AII]

57. Healthcare settings should have policies and procedures for cleaning transport vehicles, especially when used for multiple purposes. [BIII]

3.8 Assessment of Cleanliness and Quality Control

The ES department is responsible to ensure that the quality of cleaning maintained in the healthcare setting meets appropriate IPAC best practices. The responsibility for ensuring that the standardized cleaning practices are adhered to lies not just with the person performing the task but also with the direct supervisor and management of the department or agency providing the cleaning service. To that end, it is important to incorporate elements of quality improvement into the program, including monitoring, audits, and feedback to ES staff and management.

Monitoring of cleaning practices should be an ongoing activity built into the routine cleaning regimen. Regularly scheduled monitoring should take place immediately after cleaning, to ensure that the cleaning has been carried out correctly and to an appropriate standard. Data from monitoring should be retained and used in trend analysis and compared with benchmark values that have been obtained during the validation of the cleaning program.[138] Checklists and audit tools will assist supervisory staff in monitoring and documenting both cleaning and disinfection.

Auditing the cleanliness of the healthcare setting periodically and whenever changes to methodologies are made is essential to ensure that achievable cleanliness standards are maintained and to ensure consistency of standards throughout time in changing circumstances.

Results from monitoring and audits should be provided to the individual, program, or area in a timely fashion, as feedback of results has been shown to increase motivation and engagement with resulting improvements in cleaning scores.[73, 139]

Measures of cleanliness, as applied to each item in the healthcare setting, ensure a consistent, uniform interpretation of what is considered to be clean. Measures of cleanliness are used for:

- training new ES staff
- conducting cleaning audits
- ensuring that cleaning expectations are clear for all staff.

There are several methods of evaluation available to determine if effective cleaning has taken place, and are summarized in Table 6, below.

Table 6 - Summary of Cleaning Evaluation Methodologies

	Advantages	Disadvantages
Assessing Performance: assist in determining adherence to cleaning protocols		
Visual Assessment of Cleanliness	• Can be applied to entire facility or specific units/departments • Ease of implementation and scheduling • Assessment criteria are based on expected outcomes of cleanliness • Benchmarking is possible	• May be delay in feedback dependent on method used for compilation of results • Dependent on subjective determination of expected amount of dust and debris accumulated since last clean (within 24 hours) • Does not assess or correlate to bioburden
Observation of Individual Performance	• Can be used for large areas (units, rooms) • Ease of implementation and maintenance • Benchmarking is possible • Simple and inexpensive • Staff engagement	• Subjective - difficulty in standardizing the methodology • Labour intensive • Results might be impacted by the Hawthorne effect • Does not assess or correlate to bioburden
Patient and Staff Satisfaction Surveys	• Can be applied to entire facility or specific units/departments • Can be done with minimal training • Benchmarking is possible	• Subjective • Dependent on patients/staff to complete the survey • Requires receipt and compilation of results (often delay in feedback) • Can be confused with clutter, fabric deficits and odours • Does not assess bioburden or correlate to bioburden
Environmental marking	• Quick • Provides immediate feedback on performance • Minimal training required • Objective • Benchmarking possible • Relatively inexpensive	• Does not assess bioburden • Labour intensive as surfaces should be marked before cleaning and checked after cleaning has been completed

	Advantages	Disadvantages
Assessing Outcome: provide an indication of infection risk		
ATP bioluminescence	· Quick · Provides immediate feedback · Minimal training required · Objective	· Expensive · Low sensitivity and specificity · No current standardization of tests · Variable benchmarks · Technology constantly changing
Environmental cultures	· High sensitivity and specificity · Objective · Provides direct indication of the presence of whatever pathogen isolated · May suggest environmental reservoir(s) and/or source of outbreak	· Expensive · Prolonged time for results · Requires access to laboratory resources and trained personnel for interpreting results · Not supported for routine use by national and international guidelines · Requires standardized benchmark to assess infection risk
Tasmanian Infection Prevention and Control Unit, Department of Health and Human Services' *"Evaluating environmental cleanliness in hospitals and other healthcare settings: What are the most effective and efficient methods to use*?"[1]		

3.8.1 Direct and Indirect Observations

Observation of the cleaned environment and of the individuals doing the cleaning may be accomplished directly, with the use of checklists and other monitoring tools completed by supervisory or other trained staff, or indirectly as feedback from patients based on their perceptions of cleanliness. These methodologies have not been standardized, and quantification of results is difficult.

3.8.1.1 Visual Assessment

Most generally accepted measures of cleanliness have previously relied on visual assessment following cleaning as an indicator of cleanliness,[4, 6, 35, 140] even though this has been shown to be an unreliable indicator to assess microbial contamination.[4, 138, 140-142] A visually clean surface may not be microbiologically or chemically clean. Visibly clean surfaces are free from obvious visual soil; chemically clean surfaces are free from organic or inorganic residues.[138]

Visual assessments do, however, provide an indication whether cleaning processes are occurring. Visual assessment should be quantified in order to make it usable for auditing purposes. The pass score for visually clean surfaces will vary with the type of activity taking place in the area.[138]

An independent third party auditor service and British Columbia health authorities have developed inspection elements with cleaning expectations, related audit tools, and standardized reports. An independent third party audit is completed yearly at minimum, with in-house managers assessing cleanliness at regular intervals.

3.8.1.2 Observation of Individual Performance

Visual observation of individuals should be done by trained observers on a routine basis to ensure consistency and reproducibility of observations and evaluations over time.[139] Feedback and retraining should be given to the observed individual in a timely fashion and this should become part of the

individual's performance review.
Checklists and other audit tools may be used on a regular basis by supervisory staff to assess the level of cleanliness and adherence to the standardized practices.

- Refer to **Appendix I**, *Sample Environmental Cleaning Checklists and Observation Tools*, for sample audit tools used to assess cleaning performance.

3.8.1.3 Patient and Staff Satisfaction Surveys

The results of *Patient and Staff Satisfaction Surveys* are an indication of the perception of the services rendered and of the environment in which they are serviced. Perceptions are not always indicative of the services that have been provided nor are perceptions always indicative of the state of the environment in which those services are provided. However, one study found that patients' perceptions of cleanliness have been found to significantly correlate with rates of MRSA bacteraemia.[143]

If surveys are used as an audit tool, the responses to questions should be measured (e.g., 'yes' for a positive response, 'no' for a negative response); a benchmark should be used for comparison/assessment (e.g., data from previous surveys); and delivery of the survey should be standardized (e.g., collect survey data for the same two-week period each year from patients on the same unit, and then compare percentage of positive responses to those of previous years).

3.8.2 Environmental Marking

Environmental marking measures the thoroughness of cleaning using a surrogate marking system. It does not measure actual cleanliness of surfaces. It involves the use of a colourless solution that is applied to objects and surfaces in the patient environment prior to cleaning, followed by detection of residual markers (if any) immediately after cleaning, usually involving fluorescence under ultraviolet (UV) light.[73, 108, 144-146]

Solutions used as markers should be environmentally stable, dry quickly, be easily removed with light cleaning, and be invisible in regular room light but be easily visualized using other means.[147] The marker solution is applied to high-touch surfaces in patient/resident rooms prior to cleaning, then evaluated afterwards to see if the solution was removed by the cleaning. Some difficulty may be encountered in removing the marking agent from rough and porous surfaces (e.g., wood, canvas straps and restraints), possibly falsely reducing cleaning rates and indicating that a particular surface or item may need replacement.

Environmental marking may be used either on a daily basis to assess routine cleaning, or prior to discharge to assess discharge/transfer cleaning.[73, 108, 144, 145] Regular monitoring combined with feedback has been shown to lead to a change in behaviour and remarkable improvements in cleaning, which persist for long periods of time.[147-150] To ensure consistency of auditing practices and comparability and measurability of results, a standardized audit form should be adopted for the facility, and training provided to the auditors.

This methodology may be quantified:

- by calculating the percentage of marked objects/surfaces that were cleaned in a particular room or area; or
- by deriving a cleaning score (e.g., 3 = heavy fluorescence, 2 = moderate fluorescence, 1 = light fluorescence, 0 = no fluorescence).

- Refer to **Appendix K**, *Sample Environmental Marking Audit form*, for a sample audit tool.

3.8.3 Measures of Cleanliness: Residual Bioburden

Microbiologically clean surfaces are those with a microbial load that is at an acceptable level (i.e., below the level required for transmission, if known). Assessing the residual bioburden – i.e., the actual bacterial and viral load that remains on an item or surface following cleaning – may be useful when used in a targeted way for a specific purpose. Several recent studies have shown that cleaning regimens may be successfully assessed using a new technology that is based on bioluminescence of organic material remaining on cleaned surfaces.[140, 151, 152]

3.8.3.1 ATP Bioluminescence

Adenosine triphosphate (ATP) is a chemical substance that is present in all living cells, including bacteria and viruses. Detection of this substance would indicate that organic material is present on an object or surface. ATP detection involves the use of an enzyme and substrate from the firefly, which is combined with ATP picked up from the environment on a swab. The resulting bioluminescence or output of light may be measured using a sensitive luminometer. Results are expressed as Relative Light Units (RLU).

ATP bioluminescence is a quantitative method rather than a qualitative method of detection, which reflects the amount of bioburden present rather than the type of bioburden present. ATP testing can be used to provide instant feedback on surface cleanliness, demonstrating deficiencies in cleaning protocols and techniques to staff. It does not necessarily indicate true infection risk for patients. ATP may also be used to evaluate novel cleaning methods such as steam cleaning and microfibre cloths.[151]

In 2010, Dancer et al[153] found that monitoring hospital environments using ATP bioluminescence had a sensitivity and specificity of only 57%, making this an unreliable tool for routine monitoring purposes at the present time. ATP can also be confounded by the presence of bleach, microfibre products, and manufactured plastics used in cleaning.[154] Introducing ATP monitoring into hospitals should begin as part of a systematic program that includes data collection, audit, and feedback for both infection control and ES staff.[154]

Benchmark values of 250 RLU[151] to 500 RLU[140, 141] have been proposed. Benchmark values may differ depending on the detection system that is used or the healthcare setting. For example, it has been suggested that 250 RLU is an appropriate ATP benchmark for an ICU,[151, 155] but 500 RLU may be a more achievable cleaning standard in a busy medical or surgical ward.[142]

Additional studies from multiple healthcare settings are needed before a standardized ATP bioluminescence breakpoint can be established for defining surfaces as being adequately cleaned.

3.8.3.2 Environmental Culture

Routine environmental cultures in healthcare settings are neither cost-effective nor generally recommended.[16] The presence of a particular microorganism on an environmental surface does not confirm it as the cause of a patient infection, even if it is the same strain. Decisions to conduct environmental sampling should be made in collaboration with IPAC and the microbiology laboratory. If conducting environmental microbiologic sampling, the following recommendations should be considered:[156]

- Do not conduct random, undirected microbiologic sampling of air, water, and environmental surfaces in healthcare facilities.
- When indicated, conduct microbiologic sampling as part of an epidemiologic investigation or

during assessment of hazardous environmental conditions to detect contamination and verify abatement of a hazard.

- Limit microbiologic sampling for quality assurance purposes to biological monitoring of sterilization processes; monthly cultures of water and dialysate in hemodialysis units; and short-term evaluation of the impact of IPAC measures or changes in IPAC protocols.

Recommendations

58. There should be a process in place to measure the quality of cleaning in the healthcare setting. [BII]

59. Methods of auditing should include visual assessment, observational audits, and environmental marking. [BII]

60. There should be a third party independent visual assessment completed annually in hospitals and residential facilities. [BIII]

61. There should be a monitoring and auditing process (visual, observational, and environmental marking) in place with frequencies determined by an area's risk category (based on the Risk Stratification Matrix). [BIII]

62. Results of cleaning audits should be collated and analyzed with feedback to ES staff, and an action plan developed to identify and correct deficiencies. [BIII]

4. Best Practices in Other Areas Relating to Environmental Cleaning

4.1 Laundry

Appropriately managed soiled linen is rarely implicated in the transmission of infections,[157] although sheets and pyjamas have been shown to harbour microorganisms that readily proliferate in the moist, warm environment next to an individual's body.[158] Policies and procedures should address the collection, transport, handling, washing and drying of soiled linen, including protection of staff and hand hygiene. Published laundry regulations shall be followed if the facility does its own laundry.[12, 159]

4.1.1 Laundry Area

Laundry facilities (including healthcare settings that do their own laundry) should have policies that will ensure that laundry areas are developed so they meet all construction standards.[16, 117]

- See the Canadian Standards Associations' standard for laundry facilities, *Z314.10.2-10 Laundering, maintenance, and preparation of multiple-use gowns, drapes, and wrappers in healthcare facilities,*[160] available for purchase at: http://shop.csa.ca/en/canada/sterilization/z314102-10/invt/27030462010/
- Facility Guidelines Institute's *Guidelines for Design and Construction of Health Care Facilities (2014)*,[14] available at: http://www.fgiguidelines.org

In some settings, such as residential care, residents' belongings may be laundered on-site. Where this occurs, the following should be considered:

- washers and dryers should be of an industrial standard
- washers and dryers should not be located in the same area as a dishwasher or fridge, but should be in a dedicated laundry area
- floors and walls are made of durable materials that can withstand the rigors of the laundry area (i.e., water/steam resistant); and room has appropriate ventilation
- hand hygiene facilities are located in the laundry area.

4.1.2 Soiled Linen

All linen that is soiled with blood or other body fluids, secretions, or excretions should be handled using the same precautions, regardless of source or healthcare setting:[16, 117, 161, 162]

- Remove visible soil (e.g., faeces) with a gloved hand and dispose into toilet or hopper. Do not remove excrement by spraying with water.
- Bag or otherwise contain contaminated laundry at the point-of-care.
- Do not sort or pre-rinse contaminated laundry in care areas.
- Bag personal laundry/items (e.g., in long-term care) separately at the point of collection, or have it laundered by family members.
- Handle contaminated laundry with minimum agitation to avoid contamination of the air, surfaces and persons (e.g., roll up).
- Contain wet laundry before placing it in a laundry bag (e.g., wrap in a dry sheet or towel, or biodegradable plastic bag). Water-soluble bags and 'double-bagging' are not necessary and are not recommended.
- Linen bags should be tied securely and not be over-filled.
- Laundry carts or hampers used to collect or transport soiled linen need not be covered unless otherwise required by Regulation.

- Laundry carts or hampers should be cleaned on a regularly scheduled basis.
- If laundry chutes are used, ensure that they are properly designed, maintained and used in a manner that minimizes dispersion of aerosols from contaminated laundry:[161]
  - Ensure that laundry bags are securely bagged and tightly closed before placing the filled bag into the chute.
  - Do not place loose items in the chute.
  - Laundry chutes should be maintained under negative pressure and discharge into the soiled linen collection area.
  - Laundry chutes should be cleaned on a regular basis.
- Routine laundering practices are adequate for laundering all linens, regardless of source.

Special linen handling for patients on additional precautions is not required.

4.1.3 Washing and Drying Laundry

Patient laundry should be done as a separate cycle from environmental cleaning items such as cloths and mop heads. Instructions on washing and drying patient laundry should be posted.

- Detergents selected should be suitable to the water temperatures used.
- A temperature in excess of 50°C (122°F) for at least 10 minutes is required to kill scabies mites and eggs.[163]
- If bleach is used for linen disinfection, a level of at least 100 ppm of residual chlorine should be achieved for all laundry cycles.

4.1.4 Clean Linen

There should be a designated area to sort, package (if required), and store clean linen. Clean linen should be transported and stored in a manner that prevents inadvertent handling or contamination by dust and other airborne particles. Open carts at a minimum should be wrapped in plastic for transportation to the unit. Clean linen carts in designated areas need not be covered unless otherwise required by regulation, and with consideration of the following:

- if the area is dedicated or designated for clean linen storage
- if clean linen is exchanged out on a frequent/daily basis in very high use units.

Each patient floor should have a designated area (e.g., dedicated closet, clean supply room) for storing clean linen. If a closed cart system is used, storage of clean linen carts in an alcove is permitted if it is out of the path of normal traffic and under staff control.[14]

4.1.5 Laundry Staff Protection

Protection of staff in laundry areas includes:[117]

- the use of written safe work procedures
- training for all healthcare providers and laundry staff in the procedures for handling of soiled linen that includes IPAC and WHMIS training
- dedicated hand washing sink and ABHR that is readily available in laundry areas
- the provision of appropriate personal protective equipment, e.g., gloves, gowns or aprons, and face protection, to provide protection from potential cross-infection when handling soiled linen
- hand hygiene whenever gloves are changed or removed
- disposal of sharps at point-of-use to ensure that there are no residual sharps in linen. Laundry

staff are at risk of injury from contaminated sharps, instruments, or broken glass that may be contained with linen in the laundry bags.
- immunization of laundry staff against hepatitis B due to the high risk of sharps injury.

Recommendations

63. If the facility does its own laundry, published laundry regulations shall be followed.

64. There should be clear separation between clean and dirty laundry. [AII]

65. There should be policies and procedures to ensure that clean laundry is packaged, transported, and stored in a manner that will ensure that cleanliness is maintained. [BII]

66. There should be designated areas for storing clean linen. [BII]

67. Routine laundering practices are adequate for laundering all linens, regardless of source. [BII]

4.2 Waste Management and Disposal of Sharps

Written policies and procedures for the management of biomedical waste from healthcare settings shall be developed based on provincial[44] and municipal regulations and legislation,[46] and should address issues such as the collection, storage, transport, and the handling and disposal of contaminated waste, including sharps and biomedical waste.[12] Responsibility for sharps disposal should be clearly defined.

Waste handlers shall wear protective apparel appropriate to the risk (e.g., gloves, protective footwear), and be provided with immunization for hepatitis B.[117] A dedicated hand washing sink should be available to waste handlers.

4.2.1 Collection and Segregation of Waste

Legislation dictates that biomedical waste be handled and disposed of in a manner that avoids transmission of potential infections:[50, 117]

- Biomedical waste shall be segregated, at the point of generation, into either a plastic bag or a rigid container with a non-removable lid, and the container shall be capable of withstanding the weight of the biomedical waste without tearing, cracking or breaking. It should be transported separately from regular waste.
- Waste bags should be of a thickness that will resist puncture, leaking, and breaking, and they should be waterproof.
- Double-bagging should only be necessary when the first bag becomes stretched or damaged, or when waste has spilled on the exterior.
- Do not overfill bags. When a bag is three-quarters full, it should be closed and tied in a manner that prevents contents from escaping.

Waste should be segregated according to the categories listed in **Table 7**. Placing regular waste that does not require special disposal into yellow bags that require treatment or incineration will result in increased cost and may incur penalties from collection agencies. Waste from several different categories should not be mixed in one bag.

Table 7 - Disposal Streams for Biomedical and General Waste

Waste Category	Colour Code	Examples
Anatomical waste	Red	• Tissues, organs, body parts
Microbiological waste	Yellow	• Diagnostic specimens, cultures, vaccines
Fluid waste	Yellow	• Drainage collection units and suction container contents, blood, blood products, and other items that are not saturated or dripping with blood or body fluids
Sharps	Yellow Red (for incineration)	• Needles, syringes, lancets, blades, clinical glass
General waste	Green, black or clear	• Dressings, sponges, diapers, incontinent pads, PPE, disposable drapes, dialysis tubing and filters, empty IV bags and tubing, catheters, empty specimen containers, lab coats and aprons and pads that will not release liquid or semi-liquid blood if compressed • Isolation waste from Contact, Droplet and airborne precautions rooms • Waste from offices, kitchens, washrooms, public areas
Adapted from: PIDAC-IPC's *Best Practices for Environmental Cleaning for Prevention and Control of Infections in all Health Care Settings 2nd revision*[164]		

4.2.2 Storage of Waste

Waste should be placed in appropriate containers at the point-of-care/use and stored in a designated enclosed room with access limited to authorized staff. These areas should meet CSA Standards.

- See CSA's *Standard Z317.10-09 Handling of Waste Materials in Health Care Facilities and Veterinary Health Care Facilities.*[50] Available for purchase at: http://shop.csa.ca/en/canada/health-care-facility-engineering/z31710-09/invt/27013402009/

Healthcare facilities shall have a contingency plan for dealing with the storage of refrigerated waste in the event of:[50]

- excess waste production
- the on-site cold storage unit or treatment equipment becoming inoperative
- other disruption of disposal services.

4.2.3 Transport of Waste

All waste transported within the healthcare setting should incorporate the following procedures:[50]

- There are clearly defined transport routes for waste.
- Manual handling of waste is minimized.
- Waste transport routes avoid crossing through clean zones, public areas, or patient care units.
- A dedicated elevator is assigned for the transport of waste. If a dedicated elevator is not available, waste should not be transported at the same time as patients, food serving carts, or clean/sterile instruments/supplies/linen.
- Waste is transported in leak-proof carts which are cleaned on a regular basis.

ES staff should be Transport of Dangerous Goods (TDG) trained or supervised by an individual who is adequately trained to package and prepare waste for pickup.

All external transportation of biomedical waste shall comply with Transport Canada's *Transportation of Dangerous Goods Act and Regulation*.[165]

4.2.4 Handling of Sharps

Sharps are devices that are capable of causing a cut or puncture wound. Some examples of sharps include needles, sutures, lancets, blades and clinical glass.

Incorrectly disposed needles are the cause of most needlestick injuries in ES staff. Over-filling sharps containers can cause sharps injuries. Sharp instruments can end up in bedding or other linen after being used. Laundry staff can sustain injuries when needles or other instruments are accidentally left in bedding, linen, or other laundry. Prevention of sharps injuries may be achieved by handling laundry with care and educating staff about the risks associated with sharps, including safe disposal of sharps in puncture- resistant containers if found in the environment (e.g. sharps in laundry, waste, bedside, floor).[41, 45, 50]

ES staff shall be provided with education about the facility procedure to be followed in the event of a sharps injury, including immediate follow-up if a sharps injury occurs.

Recommendations

68. ***There shall be written policies and procedures for the collection, handling, storage, transport and disposal of biomedical waste, including sharps, based on provincial and municipal regulations and legislation.***
69. ***Waste handlers shall wear personal protective equipment appropriate to their risk.***
70. ***Non-immunized waste handlers should be offered hepatitis B immunization. [AII]***
71. ***Waste that is transported within a healthcare setting:***
    - ***should be transported following clearly defined transport routes***
    - ***should be transported by designated personnel only***
    - ***should not be transported through clean zones, public areas, or patient care units***
    - ***should not be transported on the same elevator as patients or clean/sterile instruments/supplies/linen; if a dedicated elevator is not available, transport waste at a different time from patients or clean/sterile instruments/supplies/linen***
    - ***should be transported in leak-proof and covered carts which are cleaned on a regular basis. [BII]***
72. ***There shall be a system in place for the prevention of sharps injuries and the management of sharps injuries when they occur.***

4.3 Construction and Containment

Construction activities generate dust and contaminants that may pose a risk to patients, staff, or visitors in all healthcare settings. IPAC should assess construction and maintenance projects during planning, work, and after completion to verify that IPAC recommendations are followed throughout the process.[12, 47, 166] Where required, work shall be performed under appropriately controlled conditions. IPAC and OHS have the authority to halt projects if there is a safety risk. Cleaning is of particular importance both during construction and after completion of the construction project.

It is important that there is good liaison between the contractor, ES, IPAC, and OHS. The level of cleaning that is expected during construction and at commissioning should be stated in the contract and the responsibility for cleaning both the job site and adjacent areas should be clearly defined. Where there is transport of construction materials (both clean and used materials) through the healthcare setting, a clear plan for traffic flow that bypasses care areas as much as possible should be established and adhered to.

For more information, refer to the following guidelines regarding IPAC related to facility design in healthcare facilities:

- Refer to Canadian Standards Association's (CSA) *Standard Z8000-11 Canadian Health Care Facilities (September 2011)*[13]
- Refer to the Canadian Standards Association: CAN/CSA-Z317.13-07. *Infection Control During Construction, Renovation and Maintenance of Health Care Facilities*,[166] available at: http://shop.csa.ca/en/canada/health-care-facility-engineering/cancsa-z3172-10/invt/27013482010/.
- Refer to the Facility Guidelines Institute: *2010 Guidelines for Design and Construction of Health Care Facilities,* [14] available at: http://www.fgiguidelines.org/.
- Refer to the Public Health Agency of Canada: *Construction-related Nosocomial Infections in Patients in Health Care Facilities*, available at: http://www.phac-aspc.gc.ca/nois-sinp/guide/pubs-eng.php

4.4 Environmental Cleaning Following Flooding

In the event of a flood (e.g., overflow from washing machine, dishwasher, toilet, or sewer), the area should be immediately assessed by ICP to determine the risk of contamination. Until confirmed otherwise, all staff should assume that the water is contaminated. Immediate contamination may occur if the source of the flood water harbours pathogenic bacteria (e.g., sewer or toilet overflow) and the area will need to be cordoned off until cleaning and disinfection are completed. FMO staff are instrumental in the containment and remediation plans. If the flooding involves a food preparation area, PH should be notified and contacted for direction. PH should also be notified if vaccine refrigerators are involved in a flood or if flooding leads to a prolonged power outage that compromises food or vaccine refrigeration.

For the longer term, the risk of mould from wet materials, drywall, and furnishings should be taken into account (e.g., if carpeting is still wet after 48 hours, the risk of mould increases and carpeting that remains wet after 72 hours should be removed, or earlier at the direction of IPAC or FMO).[21, 167]

See **Table 8** on the next page for designation of types of flood water and recommended action for IPAC purposes.

Table 8 – Type of Flood Water and Recommended Action for Infection Prevention and Control[167]

Category	Examples	Action
Clean Water	Broken pipes, tub overflows, sink overflows, many appliance malfunctions, falling rainwater, broken toilet tanks.	Allow materials to dry completely before use. Remove carpet if still wet after 72 hours.
Gray Water *Some degree of contamination present*	Overflow from a dishwasher, washing machine or a toilet bowl (not containing faeces), broken aquarium, punctured water bed. Gray water in flooded structures is significantly aggravated by time and temperature.	Allow materials to dry completely before use. Remove carpet if still wet after 72 hours.
Black Water *Heavily and visibly unsanitary*	Water containing raw sewage. Includes overflow from a toilet bowl containing faeces, broken sewer line, backed up sewage, all forms of ground surface water rising from rivers or streams.	Remove and discard wet carpet, drywall, furniture and other porous materials.

- See **Appendix H,** *Examples of Protocols for Cleans:* **H-28** for a sample procedure for dealing with a flood in a healthcare setting.

Recommendations

73. Healthcare settings should have a plan in place to deal with the containment and transport of construction materials, as well as clearly defined roles and expectations of Environmental Services and construction staff related to cleaning of the construction site and areas adjacent to the site. [AII]

74. All healthcare settings should have a plan in place to deal with a flood. [AII]

5. Best Practices for New and Evolving Technologies

New methods for cleaning and disinfection are continually evolving. Some, such as the use of microfibre technology for surface cleaning and mopping, have been quite successful and are now widely used. Other technologies may be used in some jurisdictions but are not in general use and should be carefully considered before use. Before considering a change from current methods for cleaning and disinfection in a healthcare setting, the newer product should be weighed against current products in terms of efficacy, ease of implementation, toxicity, effects on patient care, ergonomic considerations, and cost implications. IPAC, ES, and OHS should be involved in all decision-making relating to changes in cleaning and disinfection methodologies and products in the healthcare setting.

The following information on new and evolving technologies is based on a review of the literature and analysis of these products at December 2012. For this reason, new technologies should be reviewed on an annual basis and adopted when appropriate.

5.1 Microfibres

Microfibres (MF) are densely constructed polyester and polyamide (nylon) fibres that are approximately 1/16 the thickness of a human hair.[168] The positively charged microfibres attract dust and bacteria (which have a negative charge) — using a combination of static attraction and capillary action — from the surface pores of most surface and flooring materials and hold it tightly so that it is not redistributed around the room during cleaning. MF materials are more absorbent than conventional cloths or cotton-loop mops, enabling them to hold six times their weight in water.[168, 169] MF materials can be wet with disinfectants.[170]

If a healthcare facility changes to MF mops and cloths, training is an essential part of the implementation.[170] It is important that manufacturers' instructions on the preparation, use, and washing of the cloths, and compatibility with cleaning and disinfecting agents, is followed in order to maximize cloth performance.

- See **Appendix K,** *Advantages and Disadvantages of New Technologies (2013):* **K-1** Microfibre Mops and Cloths

5.2 Air Disinfection/Fogging

Disinfectant fogging techniques have been used in some countries for discharge/transfer cleaning of rooms, but are not in general use. Toxic gases such as formaldehyde and ethylene oxide have been used in the past, but are not currently recommended due to safety risks and long cycle times. Disinfectant fogging is not appropriate for routine disinfection, and should be restricted to discharge/transfer disinfection of isolation units and rooms involved in uncontrolled outbreaks.

Newer gaseous formulations for air disinfection, such as vapourized hydrogen peroxide (VHP), super-oxidized water and ozone gas, appear to be effective agents in comparison to standard environmental cleaning and disinfection for microorganisms such as *C. difficile*, VRE and MRSA.[3, 71, 171, 172] These technologies supplement, but do not replace, standard cleaning and disinfection practices.[173, 174] Surfaces should be physically cleaned of dirt and debris before air disinfection is used. While several of these new systems show promise, further studies are needed to assess the effectiveness and benefits of these technologies before they can be considered for discharge/transfer room disinfection in healthcare facilities.

5.3 Hydrogen Peroxide (HP) Systems

Systems that produce hydrogen peroxide (HP) for air disinfection include vapourized hydrogen peroxide (*VHP*) and aerosolized hydrogen peroxide (*aHP*). HP systems are effective against a wide range of microorganisms, including bacteria, viruses and spores, particularly those of *C. difficile*. They have been used successfully in eradicating *Serratia marcescens* from neonatal intensive care units,[175] MRSA,[71, 176-178] VRE [179, 180] and *C. difficile*.[3, 39, 176, 181-183] In one study comparing the microbiological efficacy of VHP with ultraviolet light processes, VHP was found to be significantly more effective in reducing bacterial contamination on surfaces in patient rooms, and was significantly more effective against spores.[184]

HP is relatively safe and decomposes to water and oxygen. The vapour or mist is typically delivered by a computer-controlled distribution system that ensures even distribution throughout the room while monitoring gas concentration, temperature and relative humidity. Once decontamination is complete, an aeration unit in the room converts the HP into water and oxygen. The complete decontamination process takes an average of three to five hours.

Further studies to evaluate the use of HP air disinfection as an adjunct to routine IPAC measures in actual hospital practice are needed. While the routine use of HP air disinfection is not advocated, use during outbreaks where other control measures have failed and where the environment is implicated in transmission may be warranted.

- See **Appendix K,** *Advantages and Disadvantages of New Technologies (2013):* **K-2** Hydrogen Peroxide (HP)

5.4 Ozone Gas

Ozone is a gas that has bactericidal properties, can be generated cheaply and rapidly dissociates to oxygen. Ozone gas is widely used in water disinfection to control *legionellae* and has been used successfully to inactivate the feline calicivirus[185] (a surrogate for norovirus) from small rooms such as hotel rooms and cruise liner cabins,[186] and to eliminate MRSA from the home of a healthcare provider with eczema.[187] Studies with *C. difficile* are less promising.[185]

The use of ozone gas as an antibacterial agent shows promise for future use in healthcare settings.[171, 188] In a recent study,[189] a synergistic effect was shown between low concentrations of VHP and ozone gas, with only 30 minutes of exposure required to achieve a 6 log reduction for vegetative bacteria and 45 to 90 minutes for *C. difficile*.

Ozone gas is toxic at high concentrations, precluding its use in populated areas. It should only be used in areas that may be completely sealed off for the duration of the treatment. Ozone is considered a toxic process gas under the BC Occupational Health and Safety Regulation.[45] As a result, there are strict rules regarding its generation and use in a workplace.

- See **Appendix K,** *Advantages and Disadvantages of New Technologies (2013):* **K-3** Ozone Gas

5.5 Super-oxidized Water

Super-oxidized water has hypochlorous acid as its principal ingredient, which is safe to use, is not harmful to the environment,[172] and has a broad spectrum of activity that includes spores. Many formulations have a long shelf life and are safe for the environment.[190] The use of super-oxidized water

as a disinfectant fog shows promise,[172] but requires more study before being applied to the healthcare environment.

5.6 Ultraviolet Irradiation (UVI)

The use of ultraviolet irradiation (UVI) in the healthcare setting is limited to destruction of airborne organisms or inactivation of microorganisms on surfaces. UVI inactivates microorganisms at wavelengths of 240 to 280nm.[191] Bacteria and viruses are more easily killed by UVI than are bacterial spores.[174]

Germicidal effectiveness of UVI is influenced by: [191, 192]

- amount and type of organic matter present
- wavelength of ultraviolet light
- air mixing and air velocity
- temperature and relative humidity
- exposure time
- type of microorganisms present
- ultraviolet light intensity, which is affected by distance and cleanliness of lamp tubes.

If UVI is used in a healthcare setting, warning signs should be posted in the affected area to alert staff, clients/patients/residents and visitors of the hazard. A schedule for replacing ultraviolet lamps should be developed according to the manufacturer's recommendations. UVI intensity should be regularly monitored.[193]

5.6.1 UVI Disinfection of the Air

A few studies have demonstrated that UVI is effective in killing or inactivating *M. tuberculosis* and in reducing the transmission of other infectious agents in hospitals, such as MRSA, VRE, and *C. difficile*.[194, 195] In the U.S., UVI is recommended as a supplement or adjunct to other TB infection control and ventilation measures in settings in which the need to kill or inactivate *M. tuberculosis* is essential, such as airborne infection isolation rooms.[192] UVI is not a substitute for HEPA filtration or negative pressure ventilation in airborne infection isolation rooms.[192]

5.6.2 UVI Disinfection of Surfaces

UVI disinfection has been used successfully for final disinfection of isolation units once patients have been treated for infections.[196] Pre-cleaning of visibly soiled surfaces is necessary before UVI disinfection, as ultraviolet light is absorbed by organic materials and its ability to penetrate is low.[196]

Recent studies[194, 195, 197] using UV-C light (high-energy ultraviolet light with a wavelength of 254-265 nm, in the area of the spectrum known as UV-C) have shown significant reductions in vegetative bacteria (e.g., MRSA, VRE, *Acinetobacter baumannii*) and *C. difficile* spores. Long exposure times may be required for some organisms (e.g., most fungi and some bacterial spores).

UVI disinfection of surfaces should not be used alone for disinfection, but may be a good addition to chemical disinfection to lower the bioburden of microorganisms in isolation units and during outbreaks.

➢ See **Appendix K,** *Advantages and Disadvantages of New Technologies (2013):* **K-4** Ultraviolet Irradiation

5.7 Steam Vapour

Steam has been used effectively to sterilize medical equipment, but has not been used for disinfection of environmental surfaces due to the size and immobility of equipment used to deliver the steam. Recent advancements in technology have dramatically decreased the size of steam generators, making them portable and practical.

Saturated steam is composed almost entirely of water in the vapour phase, and is hotter and drier than typical steam vapour, which is often laden with small droplets of liquid water. Because saturated steam is drier than typical steam, it poses no more risk to electronics and other devices than normal liquid disinfectants. Care should be used around thin plastic films to prevent distortion from the heat of the steam vapour.

Portable steam generators may be used to clean kitchens, bathrooms, floors, walls, and other surfaces, using steam delivered with a nozzle brush. Steam vapour is applied using a back and forth motion for five to ten seconds. Grease, oil, stains and dirt are easily and effectively extracted and bacteria and viruses are killed. Steam vapour effectively travels through biofilm to kill microorganisms that may be unreachable by the surface application of disinfectants. Portable steam cleaners have demonstrated bactericidal, virucidal, fungicidal and sporicidal activity against *C. difficile* spores in experimental situations.[198, 199] Further study in clinical situations is needed.

Steam vapour disinfection is rapid, cost-effective, safe for the environment, and leaves no residue. While its use in healthcare settings has not been well studied, it may offer a viable alternative for the future.

➢ See **K,** *Advantages and Disadvantages of New Technologies (2013):* **K5** Steam Vapour

5.8 Antimicrobial-impregnated Supplies and Equipment

New health and personal care items are continually being developed that incorporate antibacterial or antimicrobial chemicals into them (e.g., hand lotions, toothbrushes, pens, toys, bed linens). Product 'antibacterial' claims should be carefully evaluated before replacing existing items.[16] There is no evidence to suggest that the use of these products will make individuals healthier or prevent disease.

In healthcare, there has been interest in treating surfaces around clients/patients/residents with materials that retard bacterial growth (e.g., silver, stainless steel coated with titanium dioxide, glass coated with xerogel,[200] surfaces brushed or sprayed with surfacine®[201]). Treated surfaces and equipment have not been well studied in clinical settings, and little data exist to show how these antimicrobial chemicals will endure after exposure to hospital-grade cleaners and disinfectants and frequent cleaning, or whether they will prevent disease.

The only surface or surface treatment that has been shown to be effective in reducing bacterial load in field testing in hospitals is copper.[202, 203] In one cross-over study, Casey et al[202] evaluated the effect of copper-containing surfaces on microbial environmental contamination of a toilet seat, faucet handles, and a ward entrance door push plate, and recovered significantly lower numbers of microorganisms on the copper items. Similar results were found by Karpanen et al[204] when the same type of study was carried out on a busy medical ward. Items studied included door push plates and pull handles, grab rails, tap handles and sinks, overbed tables, light switches, toilet seats, commodes, and dressing trolleys.

Copper has not been shown to have an effect on the spores of *C. difficile*. The use of copper-containing materials for surfaces in the hospital environment may prove to be an adjunct for the prevention of HAIs, but requires further evaluation. It does not replace the need for routine cleaning and disinfection in healthcare settings.

The use of antimicrobial-treated surfaces for infection prevention and control is not currently recommended.

5.9 Probiotic Hygiene Products

Probiotic hygiene products utilize a non-pathogenic strain of *Bacillus subtilis* as their principle ingredient. These products have been used in Belgium and other European countries as an alternative to disinfectant agents. The ingredients are non-toxic and biodegradable and theoretically limit the growth of pathogenic bacteria on surfaces through competitive inhibition. Reports on the efficacy of these products are currently unpublished. More study is required before recommendations can be made regarding the introduction of these products in the healthcare environment.

5.10 Green Products for Disinfecting

In healthcare, especially with new construction, there is an interest in pursuing the Leadership in Energy and Environmental Design (LEED) certification, which includes a review and rating of the design, construction, and operation of high performance green buildings. This has resulted in questions regarding the potential use of alternative agents promoted as natural products that are environmentally friendly and less toxic. Products such as vinegar, lemon juice, baking soda, tea tree oil, and thyme oil have shown some antimicrobial properties in various studies. It is, however, noted that further research, with standardized methodology for efficacy and application-specific testing, is needed.[205] In addition, many of these products do not have a DIN, a number issued by Health Canada after the product safety and effectiveness has been reviewed and approved. All disinfectants shall have a DIN before being used in healthcare settings.

Recommendations

75. ***Infection Prevention and Control, Environmental Services, and Occupational Health and Safety should be consulted before making any changes to cleaning and disinfection procedures and technologies in the healthcare setting. [BIII]***

76. ***A process should be established to review new technologies provincially on an annual basis, and to consider adoption when appropriate. [CIII]***

6. Glossary of Terms

Accreditation Canada: Accreditation Canada is a not-for-profit, independent organization accredited by the International Society for Quality in Healthcare (ISQua). It provides national and international healthcare organizations with an external peer review process to assess and improve the services they provide to their patients and clients based on standards of excellence. More information is available at www.accreditation.ca.

Additional Precaution Daily Clean: daily cleaning and disinfection process for rooms/cubicles/space where patients are on additional precautions.

additional precautions: interventions implemented for certain pathogens or clinical presentations, in addition to routine infection control practices, to reduce the risk of transmission of microorganisms from patient to patient, patient to healthcare provider, and healthcare provider to patient.

airborne precautions: interventions to reduce the risk of transmission of microorganisms through the inhalation of airborne droplet nuclei or dust particles containing an infectious agent. airborne precautions include placing the patient in a negative pressure room and the use of N95 respirators and other personal protective equipment (gowns, gloves, face shields), as directed by the signage of the facility, when giving direct care to patients or when in contact with their environment.

alcohol-based hand Rub (ABHR): a liquid, gel or foam formulation of alcohol (e.g., ethanol, isopropanol) that 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.

antiseptic: an agent that can kill microorganisms and is applied to living tissue and skin.

audit: a systematic and independent examination to determine whether quality activities and related results comply with planned arrangements, are implemented effectively, and are suitable to achieve objectives.

biomedical waste: contaminated, infectious waste from a healthcare setting that requires treatment prior to disposal in landfill sites or sanitary sewer systems. Biomedical waste includes human anatomical waste; human and animal cultures or specimens (excluding urine and faeces); human liquid blood and blood products; items contaminated with blood or blood products that would release liquid or semi-liquid blood if compressed; body fluids visibly contaminated with blood; body fluids removed in the course of surgery, treatment or for diagnosis (excluding urine and faeces); sharps; and broken glass which has come into contact with blood or body fluid.

British Columbia Provincial Infection Control Network (PICNet): PICNet is a provincial program of the Provincial Health Services Authority with a specific interest in the prevention and control of healthcare associated infections. PICNet works together with partners on province-wide surveillance, development and promotion of evidence-based best practices, and the creation of educational and operational tools.

More information is available at www.picnet.ca.

Canadian Association of Environmental Management (CAEM): a national, non-profit organization representing environmental management professionals within the healthcare sector and other industry professionals responsible for environmental cleaning. The CAEM website is located at http://www.caenvironmentalmanagement.com.

IPAC-Canada: Infection Prevention and Control Canada is a professional organization of persons engaged in infection prevention and control activities in healthcare settings. IPAC-Canada members include infection prevention and control professionals from a number of related specialties including nurses, epidemiologists, physicians, microbiology technologists, public health, and industry. The IPAC-Canada website is located at http://www.ipac-canada.org/.

cleaning: the physical removal of foreign material (e.g., dust, soil) and organic material (e.g., blood, secretions, excretions, microorganisms) using mechanical and/or chemical means. Cleaning physically removes, rather than kills, microorganisms. It is accomplished with water, detergents, and mechanical action.

cleaning intensity: refers to the type of cleaning required, such as cleaning with detergent, the use of disinfectant, or the use of a sporicidal agent.

cohort: two or more patients colonized or infected with the same organism that are separated physically, in a separate room or ward, from other patients who are not colonized or infected with that organism. This can also apply to staff when they are specifically assigned to care only for patients known to be colonized or infected with the same organism.

construction clean: cleaning performed by construction workers at the end of a workday or completion of project that removes visible soil and dirt, construction materials, and workplace hazards.

contact precautions: interventions to reduce the risk of transmission of microorganisms through direct or indirect contact. Contact precautions include the use of gloves and gowns when giving direct care to patients or when in contact with their environment.

contamination: the presence of an infectious agent on hands or on a surface such as clothing, gowns, gloves, bedding, toys, surgical instruments, patient care equipment, dressings, or other inanimate objects.

continuum of care: care provided across all healthcare sectors, including settings where emergency (including pre-hospital) care is provided; hospitals; rehabilitation facilities; residential care and assisted living facilities; outpatient clinics and centres; community health centres; clinics and programs; and physician, dental, and allied health services provided on contract through health authorities.

cytotoxic waste: waste cytotoxic drugs, including leftover or unused cytotoxic drugs and tubing, tissues, needles, gloves, and any other items which have come into contact with a cytotoxic drug.

detergent: a synthetic cleansing agent that can emulsify oil and suspend soil. A detergent contains surfactants that do not precipitate in hard water and may also contain protease enzymes (see *enzymatic cleaner*) and whitening agents.

direct care provider: a healthcare provider who provides care directly to the patient.

Discharge Clean: the thorough cleaning of a patient room or bed space and bathroom following discharge, death, or transfer of the patient, or when additional precautions are discontinued, to remove contaminating microorganisms that might be acquired by subsequent occupants of the room.

disinfectant: a product that is used on surfaces or medical equipment/devices which results in disinfection. Disinfectants are applied only to inanimate objects. Some products combine a cleaner with a disinfectant.

disinfection: the inactivation of disease-producing microorganisms. Disinfection does not destroy bacterial spores. Disinfection usually involves chemicals, heat, or ultraviolet light.

droplet precautions: interventions to reduce the risk of transmission of microorganisms via respiratory droplets. Droplet precautions include the use of a surgical mask and eye/face protection whenever one is within two meters of the patient.

Drug Identification Number (DIN): In Canada, disinfectants are regulated as drugs under the *Food and Drugs Act* and Regulations. Disinfectants shall have a drug identification number (DIN) from Health Canada prior to marketing, which ensures that labelling and supporting data have been provided and that it has been established by the Therapeutic Products Directorate that the product is effective and safe for its intended use.

equipment depot: defined space dedicated to the management of patient care equipment within a healthcare facility.

environment of the patient: the immediate space around a patient that may be touched by the patient and may also be touched by the healthcare provider when providing care. The patient environment includes equipment, medical devices, furniture (e.g., bed, chair, bedside table), telephone, privacy curtains, personal belongings (e.g., clothes, books), and the bathroom that the patient uses. In a multi-bed room, the patient environment is the area inside the individual's curtain. In an ambulatory setting, the patient environment is the area that may come into contact with the patient within their cubicle. In a nursery/neonatal setting, the patient environment is the isolette or bassinet and equipment outside the isolette/bassinet that is used for the infant. See also, *healthcare environment*.

enzymatic cleaner: a pre-cleaning agent containing protease enzymes that breaks down proteins such as blood, body fluids, secretions, and excretions. Most enzymatic cleaners also contain a detergent. Enzymatic cleaners are used to loosen and dissolve organic substances on surfaces and equipment prior to cleaning.

hand hygiene: a general term referring to any action of hand cleaning. Hand hygiene relates to the removal of visible soil, or removal or killing of transient microorganisms from the hands. Hand hygiene may be accomplished using soap and running water, or an alcohol-based hand rub (ABHR).

hand washing: the physical removal of microorganisms from the hands using soap and running water.

Hawthorne effect: a phenomenon where a study subject's behaviour and/or study outcomes are altered

as a result of the subject's awareness of being under observation.

health authorities: Health authorities are responsible for the delivery of health service delivery in their respective regions. Five health authorities (Fraser Health, Interior Health, Northern Health, Vancouver Coastal Health, and Vancouver Island Health) govern, plan, and coordinate services regionally, and participate with the Provincial Health Services Authority, which coordinates and/or provides provincial programs and specialized services, such as cardiac care, transplants, and pre-hospital care. The First Nations Health Authority is a newly created entity whose role is being developed.

healthcare-associated Infection (HAI): a term relating to an infection that is acquired during the delivery of healthcare (also known as *nosocomial infection*).

healthcare environment: people and items which make up the care environment (e.g., objects, medical equipment, staff, patients) of a hospital, clinic or ambulatory setting, outside the immediate environment of the patient. See also, *environment of the client/patient/resident*.

healthcare facility: a set of physical infrastructure elements supporting the delivery of health-related services. A healthcare facility does not include a patient's home or physician/dental/other health offices where healthcare may be provided.

healthcare provider: any person working in the healthcare system. This includes, but is not limited to, the following: emergency service workers, physicians, dentists, nurses, respiratory therapists and other health professionals, personal support workers, clinical instructors, students, environmental and food service workers, facility maintenance workers, contracted providers, and home healthcare providers. In some settings, volunteers might provide care, and would be included as healthcare providers.

healthcare setting: any location where healthcare is provided, including settings where emergency care is provided; hospitals; complex continuing care; rehabilitation hospitals; long-term care homes; mental health facilities; outpatient clinics; community health centres and clinics; physician offices; dental offices; offices of other health professionals; and home healthcare.

HEPA-filter: a high efficiency particulate air filter meeting the minimum specifications of a nuclear grade filter, providing a 99.97% filtration efficiency at a 0.3 micrometre particle size.

high-touch surfaces: surfaces that have frequent contact with hands. Examples include, but are not limited to, doorknobs, call bells, bedrails, overbed tables, light switches, wall areas around the toilet, and edges of privacy curtains.

hospital: A hospital is defined by the Hospital Act (RSBC 1996) as a non-profit institution that has been designated as a hospital by the minister and is operated primarily for the reception and treatment of persons (a) suffering from the acute phase of illness or disability, (b) convalescing from or being rehabilitated after acute illness or injury, or (c) requiring extended care at a higher level than that generally provided in a private hospital.

hospital-grade disinfectant: a disinfectant that has a drug identification number (DIN) from Health Canada indicating its approval for use in Canadian hospitals.

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).

infection prevention and control (IPAC): evidence-based practices and procedures that, when applied consistently in healthcare settings, can prevent or reduce the risk of infection in patients, healthcare providers and visitors.

infection prevention and control professional (ICP): trained individual responsible for a healthcare setting's infection prevention and control activities.

infectious agent: a microorganism, i.e., a bacterium, fungus, parasite, virus, or prion, which is capable of invading body tissues, multiplying, and causing infection.

low-level disinfectant: a chemical agent that achieves low-level disinfection when applied to surfaces or items in the environment.

low-level disinfection (LLD): level of disinfection required when processing non-invasive medical equipment (i.e., non-critical equipment) and some environmental surfaces.

low-touch surfaces: surfaces that have minimal contact with hands. Examples include walls, ceilings, mirrors, window sills, and floors.

manufacturer: any person, partnership, or incorporated association that manufactures and sells medical equipment/devices under its own name or under a trademark, design, trade name, or other name or mark owned or controlled by it.

material safety data sheet (MSDS): a document that contains information on the potential hazards (health, fire, reactivity and environmental) and how to work safely with a chemical product. It also contains information on the use, storage, handling and emergency procedures all related to the hazards of the material. MSDSs are prepared by the supplier or manufacturer of the material.

medical equipment/device: any instrument, apparatus, appliance, material, or other article intended by the manufacturer to be used for the purpose of diagnosis, prevention, monitoring, treatment or alleviation of disease, injury or handicap.

micron filter: a particulate air filter that provides an 85-90% filtration efficiency at a 1 micrometre particle size.

monitoring: a planned series of observations or measurements of a named parameter (e.g., monitoring cleaning of patient rooms).

non-critical medical equipment/device: equipment/device that either touches only intact skin (but not mucous membranes) or does not directly touch the patient. Reprocessing of non-critical equipment/devices involves cleaning and may also require low-level disinfection (e.g., blood pressure cuffs, stethoscopes).

Occupational Health and Safety (OHS)/Workplace Health: preventive and therapeutic health services in

the workplace provided by trained occupational health professionals, e.g., nurses, hygienists, and physicians.

personal protective equipment (PPE): clothing or equipment worn by staff for routine practices and additional precautions (e.g., gloves, masks, protective eyewear, gowns). General work clothes (e.g., uniforms, pants, shirts, or blouses) not intended to function as protection against a hazard are not considered to be personal protective equipment.

point of care: the place where three elements occur together: the patient, the healthcare provider, and care or treatment involving patient contract. Point-of-care products should be accessible to the healthcare provider, within arm's reach, without the provider leaving the zone of care.

precautions: interventions taken to reduce the risk of transmission of microorganisms (e.g., patient-to-patient, patient-to-staff, staff-to-patient, contact with the environment, contact with contaminated equipment).

pre-hospital care: Pre-hospital care or emergency health service means the provision of first aid or medical services by a licensed healthcare professional in emergency situations as well as the provision of ongoing care during transfer to definitive care. Pre-hospital care may also include inter-facility transfer.

Public Health Agency of Canada (PHAC): a national agency which promotes improvement in the health status of Canadians through public health action and the development of national guidelines. The PHAC website is located at http://www.phac-aspc.gc.ca/new_e.html.

relative light unit (RLU): a measurement of bioluminescence or output of light.

reprocessing: the steps performed to prepare reusable medical equipment for reuse (e.g., cleaning, disinfection, sterilization).

reservoir: any person, animal, substance or environmental surface in or on which an infectious agent survives or multiplies, posing a risk for infection.

residential care: Residential care facilities provide 24-hour professional nursing care and supervision in a protective, supportive environment for people who have complex care needs and can no longer be cared for in their own homes.

routine practices: the system of infection prevention and control practices used by all healthcare providers with all patients for all care based on the premise that all blood, body fluids, and secretions are presumed to carry infectious pathogens. Routine practices were previously known as standard precautions.

safety-engineered medical device: a medical sharp with a built-in safety feature or mechanism that eliminates or minimizes the risk of accidental parenteral contact while or after the sharp is used.

sharps: any object that can readily penetrate the skin, including, but not limited to broken glass, needles, scalpels, lancets, clinical glass.

single-use/disposable: A device designated by the manufacturer for single-use only; after use it is

discarded. Single-use devices shall not be reprocessed except by an approved third party reprocessor.

sporicidal activity: A 3-4 logarithmic reduction of spores.

staff: See *healthcare providers*.

surge capacity: the ability to provide adequate services during events that exceed the limits of the normal infrastructure of a healthcare setting. This includes providing additional environmental cleaning (materials, human resources) when required, e.g., during an outbreak and when over capacity.

Terminal Clean: end of day cleaning in the operating room.

Twice Daily Clean: cleaning process that requires a daily clean and disinfection followed by a second clean and disinfection of high-touch surfaces in patient rooms and bathrooms approximately 6-8 hours later.

Two-Step Clean: process that requires an initial clean with a detergent and water, followed by disinfection of the same area (i.e., surfaces, equipment, furniture, etc.) using a disinfectant. The product for both the cleaning and disinfection steps might be the same product if a combined detergent/disinfectant is used, and the area is visibly soiled.

visibly soiled: hands or surfaces on which dirt, blood, or body fluids can be seen.

Workplace Hazardous Materials Information System (WHMIS): The Workplace Hazardous Materials Information System (WHMIS) is Canada's national hazard communication standard. The key elements of the system are cautionary labelling of containers of WHMIS ‘controlled products’, the provision of Material Safety Data Sheets (MSDS) and staff education and training programs.

WorkSafe BC: provincial agency that regulates worker health and safety, as well as provides compensation to injured workers, in British Columbia.

7. Appendix A: Summary of Recommendations for Internal Self-Assessment of Best Practices for Environmental Cleaning

This summary table is intended to assist with self-assessment internal to the healthcare setting for quality improvement purposes. (See **Appendix B**: *Ranking System for Recommendations)*

Legend: C = compliant P = partial compliance N = non-compliance

Recommendations		C	P	N	Action Plan	Accountability
Best Practices for Environmental Cleaning Infrastructure Supports						
1.	Healthcare settings should have policies that include the criteria to be used when choosing finishes, furnishings, and equipment for patient care areas. [BIII]					
2.	Infection Prevention and Control, Environmental Services and Occupational Health and Safety should be involved in the selection of surfaces and finishes in healthcare settings. [BIII]					
3.	In all healthcare settings: • worn, stained, cracked or torn furnishings should be replaced when identified [AII] • upholstered furniture and other cloth or soft furnishings that cannot be cleaned and disinfected should not be used in care areas, especially where immunocompromised patients are located [BIII] • the healthcare facility should have a plan to replace cloth furnishings with furnishings that can be cleaned and disinfected. [BIII]					
4.	Surfaces, furnishings, equipment and finishes in healthcare settings should: • be easily maintained and repaired • be cleanable with hospital-grade detergents, cleaners and disinfectants (except furnishings in residential facilities where the furniture is supplied and used exclusively by one single resident) • be smooth, nonporous, seamless, and unable to support microbial viability. [BII]					

Recommendations		C	P	N	Action Plan	Accountability
5.	Cloth items should: ・ be easily maintained and repaired ・ be seamless or double-stitched ・ be resistant to mould ・ be cleanable with hospital-grade detergents, cleaners, and disinfectants ・ be quick-drying. [BII]					
6.	Do not carpet areas that house or serve patients or where there is a high likelihood of contamination with blood or body fluids. [BII]					
7.	If used, carpet should: ・ be cleanable with hospital-grade cleaners and disinfectants ・ be cleaned by trained staff using specialized cleaning equipment and procedures ・ be removed and replaced when worn or stained ・ dry quickly to reduce the likelihood of mould accumulation. [BIII]					
8.	Clean and disinfect plastic coverings with compatible agents on a regular basis and replace if damaged. [BII]					
9.	Equipment that cannot be adequately cleaned, disinfected, or covered, including electronic equipment, should not be used in the care environment. [BII]					
10.	Non-critical medical equipment, including donated equipment and equipment provided by outside agencies, should be able to be effectively cleaned and disinfected according to recommended standards. [BII]					
11.	Non-critical medical equipment, including equipment provided by outside agencies, should have written, item-specific manufacturer's cleaning and disinfection instruction. [BII]					
12.	Equipment depots are strongly recommended for inclusion in new facility construction or major facility renovations.[BIII]					

Recommendations		C	P	N	Action Plan	Accountability
13.	Clean supply rooms/areas should: ・ be readily available in each patient care are ・ be separate from soiled areas ・ have a door that is kept closed at all times ・ protect supplies from dust and moisture, and ensure storage off the floor ・ be easily available to staff ・ contain a work counter and dedicated hand washing sink if used for preparing patient care items, but placed in a manner to prevent splash onto clean supplies ・ be spot cleaned daily, and cleaned thoroughly on a regularly scheduled basis. [BII]					
14.	Soiled utility rooms/workrooms should: ・ be readily available close to point-of-care in each patient care area ・ be separate from clean supply/storage areas ・ have a door that is kept closed at all times ・ contain a work counter and clinical sink ・ contain a dedicated hand washing sink ・ contain equipment required for the disposal of waste ・ contain personal protective equipment for staff protection during cleaning and disinfection procedures ・ be sized adequately for the tasks required ・ have high-touch surfaces cleaned daily, and room cleaned thoroughly on a regularly scheduled basis. [BII]					
15.	Sufficient environmental services storage rooms should be provided throughout the facility to maintain a clean and sanitary environment. [BIII]					

	Recommendations	C	P	N	Action Plan	Accountability
16.	Environmental services storage rooms: ・ should not be used for other purposes ・ should be situated in proximity to the unit cleaned ・ shall be maintained in accordance with good hygiene practices ・ should have appropriate personal protective equipment available ・ should have an appropriate water supply and a sink/floor drain ・ should include a dispensing system for chemicals ・ should be well ventilated and suitably lit ・ should have locks fitted to all doors and locked when not in use ・ should be appropriately sized to the material and equipment stored in the room ・ should not contain personal supplies, food or beverages ・ shall have safe chemical storage and access ・ should have WHMIS information readily available ・ should be free from clutter ・ should be ergonomically designed ・ should be cleaned on a regularly scheduled basis. [BII]					
17.	Selection of environmental services cleaning equipment should follow ergonomic principles. [AII]					
18.	Cleaning and disinfecting products should: ・ be approved for use by the organization ・ have a drug identification number (DIN) from Health Canada ・ be compatible with items and equipment to be cleaned and disinfected ・ be used according to the manufacturer's recommendations. [BII]					
19.	Disinfectants chosen for use in healthcare should: ・ be active against the usual microorganisms encountered in the healthcare setting ・ ideally require little or no mixing or diluting (or dispensed with automatic dispenser) ・ be active at room temperature with a short contact time ・ have low irritancy and allergenic characteristics ・ be safe for the environment. [BII]					

	Recommendations	C	P	N	Action Plan	Accountability
20.	Adequate resources should be devoted to Environmental Services (regardless of in-house or contracted services) in all healthcare settings that include: ・ single individual with assigned overall responsibility for the cleanliness of the physical environment ・ adequate human resources to allow thorough and timely cleaning and disinfection ・ adequate human resources to allow surge capacity during outbreaks, without compromise to other routine cleaning and disinfection ・ education and continuing education of cleaning staff by staff trained and knowledgeable in cleaning standards and practices ・ adequate time and resources to audit cleaning compliance and process review, and monitor staff performance ・ ongoing review of procedures. [BII]					
21.	If environmental services are contracted out, the Infection Prevention and Control and Occupational Health and Safety policies of the contracting services should be consistent with the facility's policies. [BII]					
22.	Environmental Services staffing levels should reflect the physical nature and the acuity of the facility; levels of supervisory staff should be appropriate to the number of staff involved in cleaning. [BIII]					
23.	Each healthcare setting should have policies and procedures to ensure that cleaning: ・ takes place on a continuous and scheduled basis ・ incorporates principles of infection prevention and control ・ clearly defines cleaning responsibilities and scope ・ meets all statutory requirements ・ allows for surge capacity during outbreaks, without compromise to other routine cleaning and disinfection. [BIII]					
24.	All aspects of environmental cleaning should be supervised and performed by knowledgeable, trained staff. [BIII]					

	Recommendations	C	P	N	Action Plan	Accountability
25.	Environmental Services should provide a training program which includes: ・ a written curriculum ・ a mechanism for assessing proficiency ・ documentation of training and proficiency verification ・ orientation and continuing education. [BIII]					
26.	Infection prevention and control education provided to staff working in Environmental Services should be consistent with Infection Prevention and Control and Occupational Health and Safety policies and practices of the healthcare setting, and should include: ・ the correct and consistent use of routine practices ・ hand hygiene and basic personal hygiene ・ signage used to designate additional precautions in the healthcare setting ・ the appropriate use of personal protective equipment ・ prevention of blood and body fluid exposure, including sharps safety. [BIII]					
27.	Environmental Services managers and supervisors should be trained and knowledgeable in cleaning and disinfection processes, as well as have an understanding of infection prevention and control principles. [BIII]					
28.	Environmental Services staff should be offered appropriate immunizations. [AII]					
29.	There shall be policies and procedures in place that include a sharps injury prevention program; post-exposure prophylaxis and follow-up; and a respiratory protection program for staff who may be required to enter an room accommodating a patient with tuberculosis, thus requiring airborne precautions be in place.					
30.	There should be appropriate attendance management policies in place that establish a clear expectation that staff do not come into work when acutely ill with a probable infection or symptoms of an infection. [AII]					
31.	Aerosol or trigger sprays for cleaning chemicals should not be used. [BIII]					
32.	There should be procedures for the evaluation of staff who experience sensitivity or irritancy to chemicals.					

	Recommendations	C	P	N	Action Plan	Accountability
Best Practices for Cleaning and Disinfection						
33.	Environmental services staff should adhere to routine practices and additional precautions when cleaning. [BII]					
34.	Environmental Services staff should follow best practices for hand hygiene. [AII]					
35.	Personal protective equipment (PPE) should be: • sufficient and accessible for all Environmental Services staff • worn as required by routine practices, additional precautions, and MSDS when handling chemicals • removed immediately after the task for which it is worn. [BII]					
36.	Gloves should be removed and hand hygiene performed on leaving each patient room/environment or bed space. Soiled gloves should not be worn when walking from room to room, or to other areas of the healthcare facility. [AIII]					
37.	In all healthcare settings, there should be a regular cleaning regimen in place. [BIII]					
38.	Cleaning schedules should be developed, with frequency and intensity of cleaning reflecting whether surfaces are high-touch or low-touch, the type of activity taking place in the area and the infection risk associated with it; the vulnerability of the patients housed in the area; and the probability of contamination. [BIII]					
39.	Cleaning agents and disinfectants shall be labelled with WHMIS information.					
40.	Cleaning agents and disinfectants shall be stored in a safe manner in storage rooms.					
41.	Automated dispensing systems, which are monitored regularly for accurate calibration, are preferred over manual dilution and mixing. [BIII]					
42.	Disinfectants should be dispensed into clean, dry, appropriately-sized bottles that are clearly labelled and dated; not topped up; and discarded after the expiry date. [AII]					

	Recommendations	C	P	N	Action Plan	Accountability
43.	Effective use of a hospital-grade disinfectant includes: ・ application of disinfectant only after visible soil and other impediments to disinfection have been removed ・ use on non-critical equipment ・ following the manufacturer's instructions for dilution and contact times ・ frequently changing disinfectant solution with no 'double dipping' of cloths into disinfectant ・ appropriate use of personal protective equipment, if required, to prevent exposure to the disinfectant. [BIII]					
44.	All healthcare facilities should develop policies and procedures that include: ・ procedures for cleaning and disinfection that incorporate infection prevention and control principles ・ defined responsibility for specific items and areas ・ clearly defined lines of accountability ・ cleaning standards for intensity and frequency ・ procedures for daily and discharge cleaning and disinfection ・ procedures for cleaning and disinfecting areas for the daily and discharge cleaning of rooms of patients on additional precautions, inclusive of escalation processes, especially for environmentally-hardy organisms such as C. difficile [BII] ・ procedures for outbreak management ・ procedures for cleaning in construction/renovation areas. [AII]					
45.	Equipment used to clean toilets: ・ should be discarded when damaged, stained, or worn ・ should be discarded after cleaning a room where patient(s) is on precautions ・ should minimize splashing. [BIII]					
46.	Bathrooms located in high traffic patient care areas should: ・ be cleaned at least twice daily ・ be inspected every four hours and re-cleaned if necessary ・ be cleaned more frequently based on need. [AII]					

	Recommendations	C	P	N	Action Plan	Accountability
47.	Environmental services cleaning carts should have a clear separation between clean and soiled items, should never contain personal items, and should be thoroughly cleaned at the end of the day. [BII]					
48.	Equipment that is used for cleaning and disinfecting should itself be cleaned and disinfected according to recommended standards for intensity and frequency. [BII]					
49.	Cleaning and disinfection equipment should be well maintained, in good repair and be cleaned and dried between uses. [BII]					
50	Mop heads and microfibre cloths should be laundered daily, and dried thoroughly before storage. [BII]					
51.	Healthcare settings shall have written policies and procedures dealing with spills of blood and other body fluids.					
52.	Non-critical medical equipment used between patients requires cleaning and possibly disinfection between patient uses. [AII]					
53.	Each healthcare setting should have written policies and procedures for the appropriate cleaning of non-critical medical equipment that clearly defines the frequency, intensity, and assigns responsibility for the cleaning. [BIII]					
54.	Areas that have toys should have policies and procedures for cleaning the toys. [AII]					
55.	All equipment used to clean and disinfect non-critical equipment should also be cleaned regularly and undergo scheduled preventive maintenance. [BIII]					
56.	Healthcare settings should have policies and procedures for cleaning specialized areas, such as hemodialysis units, operating room suites and laboratories. [AII]					
57.	Healthcare setting should have policies and procedures for cleaning transport vehicles, especially when used for multiple purposes. [BIII]					
58.	There should be a process in place to measure the quality of cleaning in the healthcare setting. [BII]					
59.	Methods of auditing should include visual assessment, observational audits, and environmental marking. [BII]					
60.	There should be a third party independent visual assessment completed annually in hospitals and residential facilities. [BIII]					

	Recommendations	C	P	N	Action Plan	Accountability
61.	There should be a monitoring and auditing process (visual, observational, and environmental marking) in place with frequencies determined by an area's risk category (based on the Risk Stratification Matrix). [BII]					
62.	Results of cleaning audits should be collated and analyzed with feedback to ES staff, and an action plan developed to identify and correct deficiencies. [BIII]					
	Best Practices in Other Areas Relating to Environmental Cleaning					
63.	If the facility does its own laundry, published laundry regulations shall be followed.					
64.	There should be clear separation between clean and dirty laundry. [AII]					
65.	There should be policies and procedures to ensure that clean laundry is packaged, transported and stored in a manner that will ensure that cleanliness is maintained. [BII]					
66.	There should be designated areas for storing clean linen. [BII]					
67.	Routine laundering practices are adequate for laundering all linens, regardless of source. [BII]					
68.	There shall be written policies and procedures for the collection, handling, storage, transport and disposal of biomedical waste, including sharps, based on provincial and municipal regulations and legislation.					
69.	Waste handlers shall wear personal protective equipment appropriate to their risk.					
70.	Non-immunized waste handlers should be offered hepatitis B immunization. [AII]					

	Recommendations	C	P	N	Action Plan	Accountability
71.	Waste that is transported within a healthcare setting: • should be transported following clearly defined transport routes o ***should be transported by designated personnel only*** • should not be transported through clean zones, public areas, or patient care units • should not be transported on the same elevator as patients or clean/sterile instruments/supplies/linen. If a dedicated elevator is not available, waste should be transported at a different time from patients or clean/sterile instruments/supplies/linen. • should be transported in leak-proof and covered carts which are cleaned on a regular basis. [BII]					
72.	There shall be a system in place for the prevention of sharps injuries and the management of sharps injuries when they occur.					
73.	Healthcare settings should have a plan in place to deal with the containment and transport of construction materials, as well as clearly defined roles and expectations of Environmental Services and construction staff related to cleaning of the construction site and areas adjacent to the site. [AII]					
74.	All healthcare settings should have a plan in place to deal with a flood. [AII]					
	Best Practices for New and Evolving Technologies					
75.	Infection Prevention and Control, Environmental Services, and Occupational Health and Safety should be consulted before making any changes to cleaning and disinfection procedures and technologies in the healthcare setting. [BIII]					
76.	A process should be established to review new technologies provincially on an annual basis, and consider adoption when appropriate. [CIII]					

8. Appendix B: Ranking System for Recommendations

Categories for strength of each recommendation	
CATEGORY	**DEFINITION**
A	Good evidence to support a recommendation for use
B	Moderate evidence to support a recommendation for use
C	Insufficient evidence to support a recommendation for or against use
D	Moderate evidence to support a recommendation against use
E	Good evidence to support a recommendation against use
Categories for quality of evidence on which recommendations are made	
GRADE	**DEFINITION**
I	Evidence from at least one properly randomized, controlled trial
II	Evidence from at least one well-designed clinical trial without randomization, from cohort or case-controlled analytic studies, preferably from more than one centre, from multiple time series, or from dramatic results in uncontrolled experiments
III	Evidence from opinions of respected authorities on the basis of clinical experience, descriptive studies, or reports of expert committees

NOTE: When a recommendation is based on a regulation, no grading will apply.

Adapted and reproduced from the Canadian Task Force on the Periodic Health Examination, 2009

9. Appendix C: Example of Equipment Depot Clean Tag System and Equipment Depot Cleaning Schedule

November 21, 2012 **NEW LAMINATED RE-USABLE CLEAN TAGS**

New Laminated Tag

USE WHITEBOARD MARKERS ONLY

Environmental Services:

1. ES cleans equipment coming to the equipment depot.
2. ES completed the yellow portion of the laminated clean tag and places on the equipment.
3. ES or unit calls material porter for pick up and return to the equipment depot.

Material Porter – Incoming equipment:

4. Material Porter (MP) goes to the unit to picks up equipment – while on unit MP will inspect equipment for cleanliness, tag attached and information completed on tag.
5. If equipment is still soiled or the tag is not filled in by the housekeeper, then the MP will call the ES call centre to report soiled equipment/no tag information completed.
6. If equipment is clean - MP brings equipment to equipment depot cleaning room.
7. MP inspects equipment for good working repair and then sanitizes equipment.
8. MP completes pink portion of the laminated clean tag and places back onto that piece of equipment.
9. MP places equipment in designated equipment depot spot.

Material Porter – Outgoing equipment:

10. MP removes laminated tag and places tag in designated bin (night shift porters will percept tags [both sides] ready for next day's usage)
11. MP places pink paper delivery tag on equipment and delivers to unit.

(small hole for zip tie)

Return to Equipment Depot

Location: _____

Initial: _____

Date: _____

Inspected by Equipment Depot and Deemed Safe for Patient Use

Initial: _____

Date: _____

Example of Equipment Depot Cleaning Schedule

Frequency	Task	Responsibility	Notes and Documentation
Daily	Wipe and sanitize both sides of used clean equipment tags then stock clean tags for ES	Depot staff	Sign the monthly cleaning sheet
Daily	Sanitize the lakeside cart, counters, and benches with Percept in the decontamination room	Depot Staff	Sign the monthly cleaning sheet
Daily	Wipe and sanitize the depot staff desks, bookshelves, computer station, keyboard, telephones, office chairs	Depot Staff	Sign the monthly cleaning sheet
Daily	Wipe down depot staff talkback radios	Depot Staff	Done at start of each shift.
Daily	Garbage and recycling pick up	ES	Sign the monthly cleaning sheet
Daily	Clean sinks, refill paper supplies and soap dispenser	ES	Sign the monthly cleaning sheet
2x Weekly	Dust mop floors	ES	Sign the monthly cleaning sheet
Bi-Weekly	Damp mop/autoscrub all floors	ES	Sign the monthly cleaning sheet
Weekly	High dusting and deep cleaning	ES	Sign the monthly cleaning sheet
Monthly	Pressure wash of decontamination room	ES	Scheduled for the last Sunday or the Month Sign the monthly cleaning sheet
Monthly	Examine clean equipment tags on every piece of equipment, re-clean anything that has been stored in the depot more than 30 days and then re-date and sign the tag accordingly	Depot Staff	Scheduled for 1st Monday of each Month Document for each type of equipment and submit to your supervisor. Sign the monthly cleaning sheet
Monthly	Wipe down all extra ceiling lifts, all wire carts, shelves, plastic bins (inside & out), all power bars, receptacles and conduits running along the walls.	Depot Staff	Scheduled for 1st Monday of each Month Sign the monthly cleaning sheet.
Annually	Wall washing	ES	Sign the annual cleaning sheet
Annually	Ceiling cleaning	ES	Sign the Annual cleaning sheet

[Developed and shared by Vancouver Island Health Authority]

10. Appendix D: Risk Stratification Matrix to Determine Intensity and Frequency of Cleaning

This matrix is meant to be used by ES Managers/Supervisors in consultation with IPAC to assign cleaning frequencies to the various areas of the healthcare facility. There needs to be flexibility to amend frequencies and intensities of cleaning to accommodate surge capacity needed for issues such as outbreaks, specific organism of concern or over-census situations.

Step 1: Assess and Score the Factors that Impact the Frequency and Intensity of Cleaning

Probability of Contamination With Pathogens
Heavy Contamination (score = 3) ・ Surfaces and/or equipment are routinely exposed to copious amounts of fresh blood or other body fluids (e.g., birthing suite, autopsy suite, cardiac catheterization laboratory, visibly soiled bathroom, treatment room or ambulance when there has been major trauma).
Moderate Contamination (score = 2) ・ Surfaces and/or equipment do not routinely (but may) become contaminated with blood or other body fluids. ・ All patient spaces and bathrooms should be considered to be, at a minimum, moderately contaminated.
Light Contamination (score = 1) ・ Surfaces unlikely to be exposed to blood, other body fluids, or items that have come into contact with blood or body fluids.
Vulnerability of Population to Infection (consult with Infection Prevention and Control)
More Susceptible (score = 1) Patients who are immunocompromised (e.g. Oncology, neonates, patients with transplant, burns, or major invasive procedures)
Less Susceptible (score =0) Persons from all other areas (e.g. general patients, outpatients, staff areas)
Potential for Exposure
High Touch Surfaces (score= 3) Surfaces that come in frequent contact with hands such as bedrails, light switches, doorknobs, telephone, call bells, unit computer keyboards.
Low Touch Surfaces (score = 1) Surfaces that are not frequently touched, such as walls, mirrors, ceilings, and door sills

Step 2: Add the 3 factor scores to establish a Total Risk Score

Factors that Impact Frequency and Intensity of Cleaning	**Score**
Probability of Contamination of Pathogens	
Vulnerability of Population to Infection	
Potential for Exposure	
Total Risk Score	

Step 3: Using the table below and the Total Risk Score, determine the intensity and frequency of cleaning

Total Risk Score	Risk Category	Explanation	Cleaning Intensity	Minimum Cleaning Frequency
7	Very High Risk	Very high risk for transmission of infection because of the vulnerability of the patient and/or treatment or procedure. Cleaning should be at a high level of intensity and frequency.	Cleaning and Disinfection	After each case/event/procedure Cleaning additionally as required (i.e. visible soiling)
6	High Risk	High risk for transmission of infection because of the vulnerability of the patient and/or treatment or procedure. Cleaning intensity and frequency should be clearly defined and strictly adhered to.	Based on agency protocols	Clean at least once a day, or if not used daily, clean between patients Clean additionally as required (i.e., visible soiling)
4-5	Moderate Risk	In these areas the risk for transmission can be minimized. Cleaning intensity and frequency should be clearly defined and strictly adhered to.	Based on agency protocols	Clean once daily Clean between patients Clean additionally as required (e.g., visible soiling)
2-3	Low Risk	In these areas risk to individuals is minimal, cleaning is important to maintain good hygiene and confidence in appearance of the area.	Cleaning	Clean according to a fixed schedule Clean additionally as required (e.g., visible soiling)

The examples given are inclusive of all bathrooms, hallways, etc. and any medical equipment in that area. Cleaning in between patient use should be done even if not noted.

[Adapted from the PIDAC-IPC's *Best Practices for Environmental Cleaning for Prevention and Control of Infections in All Health Care Settings* 2nd Revision[164] and State of Victoria Department of Health's *Cleaning Standards for Victorian health facilities* 2011.[5]]

Examples: Using the Risk Stratification Matrix to Determine Risk Score PLEASE NOTE: this is not an all inclusive list.

Location	Probability of Contamination Light = 1 Moderate = 2 Heavy = 3	Potential for Exposure High Touch = 3 Low Touch = 1	Population Less Susceptible = 0 More Susceptible = 1	Total Score	Recommended cleaning (assuming daily use)
Admission/Discharge Units	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
Autopsy/Morgue	3	3	0	6	Clean at least once per day Clean additionally as required
Burn Unit	2	3	1	6	Clean at least once per day Clean additionally as required
Cardiac Catheterization and Angiodynography Area	3	3	1	7	Clean after each case/event/procedure and at least once per day Clean additionally as required
Chemotherapy Unit	2	3	1	6	Clean at least once a day and after each patient Clean additionally as required
Clean Linen Handling and Storage Area	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
Cystoscopy	3	3	0	6	Clean at least once a day and after each patient Clean additionally as required
Dental Procedure Room	3	3	0	6	Clean at least once a day and after each patient Clean additionally as required
Diagnostic Imaging	1	3	0	4	Clean according to a fixed schedule Clean additionally as required
Dining Room/Cafeteria and Food Preparation Areas	1	3	0	4	Clean at least once daily Clean additionally as required
Emergency Department patient cubicle	3	3	0-1	6-7	Clean high touch surfaces after each patient Clean additionally as required
trauma room	3	3	1	7	Clean after each event Clean additionally as required
other emergency areas	1	3	0	4	Clean daily or according to a fixed schedule

Location	Probability of Contamination Light = 1 Moderate = 2 Heavy = 3	Potential for Exposure High Touch = 3 Low Touch = 1	Population Less Susceptible = 0 More Susceptible = 1	Total Score	Recommended cleaning (assuming daily use)
					depending upon intensity of use Clean additionally as required
Equipment Depot	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
Equipment Reprocessing Area (MDRD)	3	3	0	6	Clean at least once per day Clean additionally as required
Hemodialysis dialysis station	3	3	1	7	Clean after each case Clean additionally as required
Intensive Care Unit	3	3	1	7	Clean after each case/event/procedure and daily Clean additionally as required
Laboratory	2	3	0	5	Clean daily Clean additionally as required
Labour and Birthing Rooms	3	3	1	7	Clean after each case/event/procedure Clean additionally as required
Laundry - soiled linen area	2	3	0	5	Clean at least once daily Clean additionally as required
Nuclear Medicine	1	1	0-1	2-3	Clean according to a fixed schedule Clean additionally as required
Nursery (well baby)	2	1	2	4	Clean according to a fixed schedule Clean additionally as required
Occupational Therapy	1	3	0	4	Clean according to a fixed schedule Clean additionally as required
Offices	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
On Call Rooms	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
Operating Room Suite	3	3	1	7	Clean after each case/event/procedure Clean additionally as required

Location	Probability of Contamination Light = 1 Moderate = 2 Heavy = 3	Potential for Exposure High Touch = 3 Low Touch = 1	Population Less Susceptible = 0 More Susceptible = 1	Total Score	Recommended cleaning (assuming daily use)
Pacemaker Insertion Room	3	3	0-1	6-7	Clean after each case/event/procedure Clean additionally as required
Patient Room/Environment/ Patient Compartment (ambulance)	2	3	0-1	5-6	Clean at least once daily and after each patient Clean additionally as required
Patient Compartment (ambulance) –after major trauma, delivery	3	3	0-1	6-7	Clean after each event, may require a deep clean
Pharmacy admixture room or general area	1	3	0-1	4-5	Clean at least once daily Clean additionally as required
Physical Plant Workshops	1	3	0	4	Clean at least once daily Clean additionally as required
Physiotherapy	1	3	0	4	Clean according to a fixed schedule Clean additionally as required
Office Treatment Room	2	3	0	5	Clean at least once a day and after each patient Clean additionally as required
Public Areas - Corridors, Elevators, Stairwells, Lobbies, Libraries, Meeting rooms, Locker rooms	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
Activity Room	1	3	0	4	Clean according to a fixed schedule, depending upon intensity of use (may be daily) Clean additionally as required
Respiratory Therapy (treatment area)	2	3	0-1	5-6	Clean at least once a day and after each patient Clean additionally as required
Sterile Supply Area	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
Transplant Unit	2	3	1	6	Clean at least once a day and after each patient Clean additionally as required

11. Appendix E: Advantages and Disadvantages of Hospital-grade Disinfectants and Sporicides Used for Environmental Cleaning

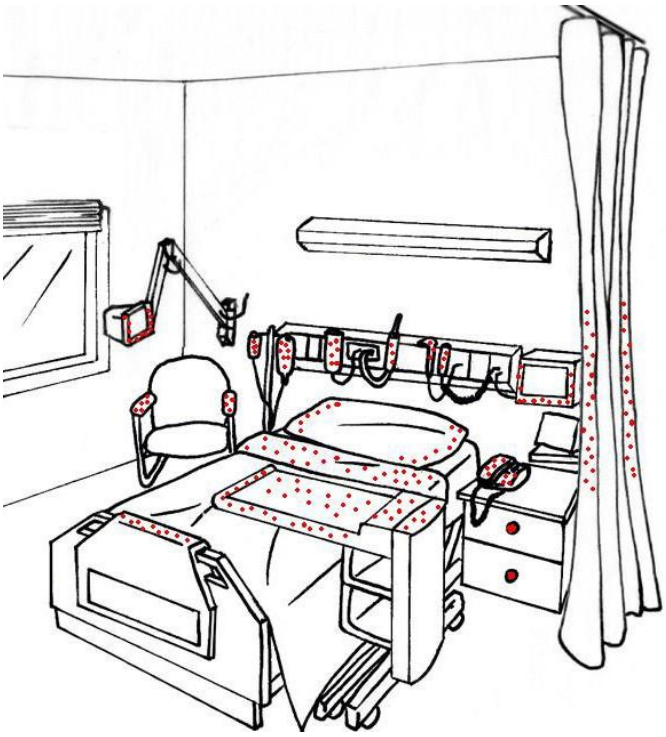
Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
Alcohols (70-95%)	• External surfaces of some equipment (e.g., stethoscopes) • Non-critical equipment used for home healthcare • Disinfection is achieved after 10 minutes of contact • Observe fire code restrictions for storage of alcohol	• Non-toxic • Low cost • Rapid action • Non-staining • No residue • Effective on clean equipment/devices that can be immersed	• Evaporates quickly; not a good surface disinfectant • Evaporation may diminish concentration • Flammable: store in a cool well ventilated area; refer to Fire Code restrictions for storage of large volumes of alcohol • Coagulates protein; a poor cleaner • May dissolve lens mountings • Hardens and swells plastic tubing • Harmful to silicone; causes brittleness • May harden rubber or cause deterioration of glues • Inactivated by organic material • Contraindicated in the O.R.
Chlorines (e.g., sodium hypochlorite or bleach)	• Hydrotherapy tanks, exterior surfaces of dialysis equipment, cardiopulmonary training mannequin, environmental surfaces (use 0.1% for surface cleaning and soaking of items) • Non-critical equipment used for home healthcare • Blood spills (use 0.05% sodium hypochlorite for a minor blood spill and 0.5% for a major blood spill) • See **Table 5** for instructions on preparing diluted bleach solutions)	• Low cost • Rapid action • Readily available in non hospital settings • Sporicidal at higher concentrations (see Table 5 for sporicidal concentrations and contact times)	• Corrosive to metals • Inactivated by organic material; for blood spills, blood should be removed prior to disinfection • Irritant to skin and mucous membranes • Should be used immediately once diluted • Use in well-ventilated areas • Should be stored in closed containers away from ultraviolet light & heat to prevent deterioration • Stains clothing and carpets

Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
Hydrogen peroxide enhanced action formulation (HP- EAF) 0.5% **(7% solution diluted 1:16)**	• Isolation room surfaces • Clinic and procedure room surfaces • Low-level disinfection is achieved after 5 minutes of contact at 20°C • Monitoring not required, however test kits are available from the manufacturer	• Safe for environment • Non-toxic • Rapid action • Available in a wipe • Active in the presence of organic materials • Excellent cleaning ability due to detergent properties	• Contraindicated for use on copper, brass, carbon-tipped devices and anodised aluminum • Expensive
Hydrogen peroxide enhanced action formulation (HP- EAF) 4.5%	• Disinfection of toilet bowls, sinks, basins and commodes in washrooms of *C. difficile* patients • **Following cleaning,** sterility is achieved with a 4.5% solution after 10 minutes of contact • Do not use on medical devices or equipment or as a general environmental surface cleaner or disinfectant	• Sporicidal • Available in a gel format to ensure vertical surface adhesion during required contact time • Safe for environment • Non-toxic	• Expensive • Contraindicated for use on copper, brass, carbon-tipped devices and anodised aluminum, rubber, plastics • Do not use on monitors • Initially when used, may remove previous residue from other products
Hydrogen peroxide 3% (Non-antiseptic formulations)	• Non-critical equipment used for home healthcare • Floors, walls, furnishings • Disinfection is achieved with a 3% solution after 30 minutes of contact	• Rapid action • Safe for the environment • Non-toxic	• Contraindicated for use on copper, zinc, brass, aluminum • Store in cool place, protect from light
Iodophors (Non-antiseptic formulations)	• Hydrotherapy tanks • Thermometers • Hard surfaces and equipment that do not touch mucous membranes (e.g., IV poles, wheelchairs, beds, call bells) • **DO NOT use antiseptic iodophors as hard surface disinfectants**	• Rapid action • Non-toxic	• Corrosive to metal unless combined with inhibitors • Inactivated by organic materials • May stain fabrics and synthetic materials

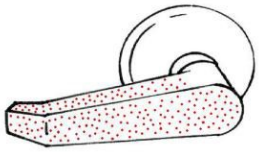
Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
Phenolics	• Floors, walls and furnishings • Hard surfaces and equipment that do not touch mucous membranes (e.g., IV poles, wheelchairs, beds, call bells) • **DO NOT use phenolics in nurseries**	• Leaves residual film on environmental surfaces • Commercially available with added detergents to provide one-step cleaning and disinfecting • Slightly broader spectrum of activity than QUATS	• **Do not use in nurseries or on equipment contacting infants (e.g., baby scales)** • Not recommended for use on food contact surfaces • May be absorbed through skin or by rubber • May be toxic if inhaled • Corrosive • Some synthetic flooring may become sticky with repetitive use
Quaternary ammonium compounds (QUATS)	• Floors, walls and • furnishings • Blood spills prior to infection	• Non-corrosive, non-toxic, low irritant • Good cleaning ability, usually have detergent properties • May be used on food surfaces	• **Do not use to disinfect instruments** • Limited use as a disinfectant because of narrow microbicidal spectrum • Diluted solutions may support the growth of microorganisms • May be neutralized by various materials (e.g., gauze)

Adapted from the Ministry of Health's *Best Practice Guidelines for Cleaning, Disinfection and Sterilization of Critical and Semi-critical Medical Devices in BC Health Authorities*[10]

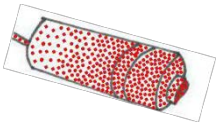
12. Appendix F: Examples of High-Touch Items and Surfaces in the Healthcare Environment



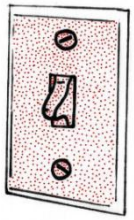
Patient Room



Door Handle



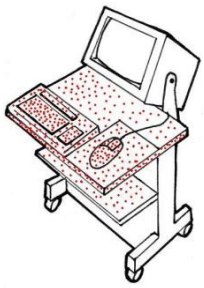
Call Bell



Light Switch

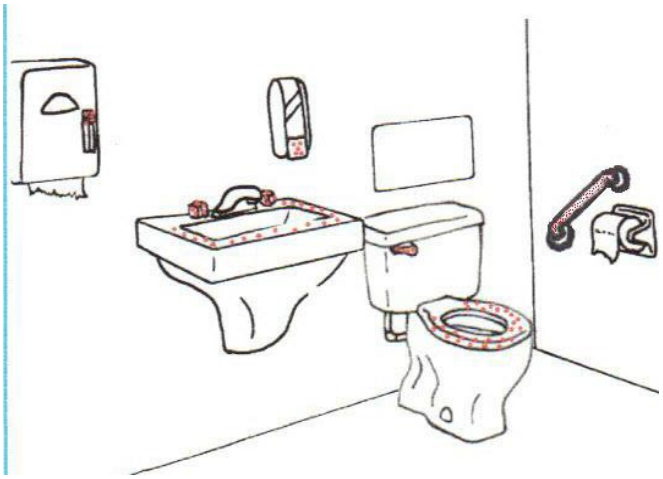
Nursing Station

ECG Cart



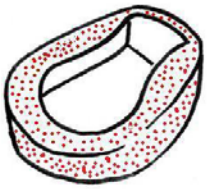
Computer on Wheels

Figure 1a: Examples of High-touch Items and Surfaces in the Healthcare Environment

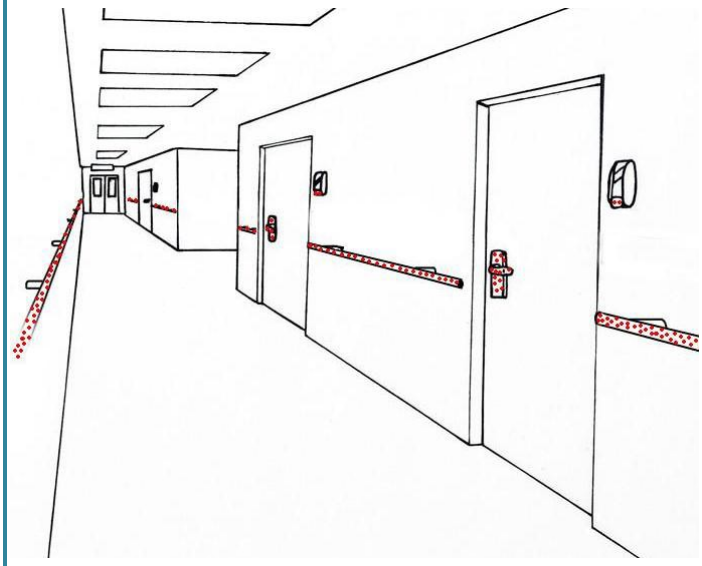


Patient Bathroom

Commode



Bedpan



Hallway on Patient/Resident Floor

Transport Items

Wheelchair

(NOTE: Dots indicate areas of highest contamination and touch)

13. Appendix G: Recommended Minimum Cleaning and Disinfection Level and Frequency for Non-critical Patient Care Equipment and Environmental Items

The following chart relates to **non-critical patient care equipment** only, i.e., equipment that comes into contact with intact skin. Refer to **Appendix F** for appropriate agents that may be used for cleaning and disinfection of non-critical patient care equipment.

The minimum intensity (clean or LLD) will be dependent on the risk category for the area, with a basic premise that all items purchased for use in healthcare settings are cleanable, any item that is used between patients should be cleaned and disinfected between patients, and cleaning and disinfection is always required after use when a patient is on additional precautions. For the purposes of this Appendix, direct care and nursing staff includes and is not limited to: nurses, therapists, unit aides, IPC aides, OR aides, technicians. **Each agency will need to develop their own table based on categories of staff and types of departments present at their facility.**

PLEASE NOTE: This is not an all inclusive list.

Legend for Cleaning/Disinfection: CL = Clean only LLD = Clean + Low Level Disinfection HLD = High Level Disinfection

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Airflow sensors (Sleep Lab)	LLD	Visibly clean with no blood and body substances, dust, dirt, debris	When soiled At discharge Between patients	Direct care staff	Clean with detergent and water before disinfection.
Apnea monitor (monitor/sensor pad)	LLD	Visibly clean with no blood and body substances, dust, dirt, debris	When soiled At discharge Between patients	Direct care staff	
Basin (bath or wash)	CL LLD	Visibly clean with no debris, hair, stains, or soap residue	After each use: same patient At discharge	Direct care staff	Wipe clean after each use for same patient. Use washer/disinfector or send to reprocessing area

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Bassinette	LLD	Visibly clean with no blood and body substances, dust, dirt, debris	Weekly When soiled At discharge	ES	
Bath seat/raised toilet seat dedicated to one patient multiple patient use	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled LLD	Visibly clean with no blood and body substances, dust, dirt, debris	Daily When soiled At discharge Between patients	ES Direct care staff	Ideally dedicated to patient during their hospital stay
Bathtubs	LLD	Visibly clean with no blood and body substances, hair, dust, dirt, debris, lime scale, stains Specialty tubs: according to manufacturer's directions	Daily Between patients	ES Direct care staff	Iodine and chlorine products may damage tub surfaces.
Bed bedrail and extender mattress visitor cot	 CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	 Free of visible dust, soiling, stains, hair and strings; rails, handles and controls will be free of dust, soiling or stains	 Daily When soiled At discharge Daily and at discharge when used	 ES ES	 Any malfunctioning of electrical or mechanical functioning should be reported and/or replaced.

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Bedpan and Urinal dedicated to one patient bariatric commode pot	LLD	Visibly clean with no blood and body substances or stains	Emptied and cleaned after use and between patients	Direct care staff/unit aides	Washer/disinfectors may be used. If pot does not fit in unit-based washer/disinfector, needs to be manually cleaned and disinfected or sent to reprocessing area.
Bladder scanner	LLD	Clean according to manufacturer's directions. Clean probe and keyboard.	When soiled Between patients	Direct care staff/unit aides	Keyboard should have a plastic protective cover to all for an easily cleaned surface.
Blanket warmers exterior interior	CL	Visibly clean with no blood and body substances, dust, dirt, debris, lime scale, stains or spillages	Daily and when soiled Weekly and when soiled	ES	
Blood pressure cuff dedicated to one patient used between patients	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled LLD	Clean according to manufacturer's directions.	Daily When soiled At discharge Between patients	ES Direct Care staff	Ideally dedicated to one patient

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Call bell	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Visibly clean with no blood and body substances, dust, dirt, debris, stains	Daily At discharge	ES	Cord should be a washable cord with clip (no kling gauze or pins). Any frayed cord should be reported and replaced.
Cardiac monitor	CL	Clean according to manufacturer's directions.	Daily Between patients	Direct care staff	
Cart: stainless steel trolley	CL LLD - precautions	Wipe all surfaces.	Between uses	Staff	Responsibility will be dependent on use of trolley (dietary, laundry, etc.).
Cart: procedure cart	LLD	Wipe all surfaces with AHP wipes -apply 'clean' tag -store in designated 'clean' area	Between uses	Direct care staff	
Cart: resuscitation (crash cart) defibrillator outside/drawers	LLD CL LLD - precautions	Clean according to manufacturer's directions. Visibly clean with no blood and body substances, dust, dirt, debris, stains, spills	After use When soiled After each use When soiled	Direct care staff and/or biomedical personnel or reprocessing area	All disposable items should be discarded if packaging is not cleanable (unless drawer unopened). Any trays may require HLD

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Cast cutting blades saws	CL or disposable CL	Visibly clean with no blood and body substances, dust, dirt, debris	When soiled When soiled	ES	Send for sterilization if contact with blood or body fluids. Discard if single-use blades.
Chair includes recliners, patient chairs, shower chairs	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Visibly clean with no blood and body substances, dust, dirt, debris, spills	Daily When soiled At discharge (when in patient room)	ES	Only chairs that are easily cleaned should be purchased for care areas.
Chart cover includes patient chart binders, clipboards where manual records are used	CL – Routine LLD – Precaution	Wipe down inside and outside surfaces.	When soiled Monthly cycle	ES/Unit Aides	Charts and clipboards should not go into rooms on precautions. Replace worn binders.
Commodes dedicated to one patient multiple patient use	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled LLD	All surfaces should always be visibly clean and free from blood, urine, and fecal matter.	Daily When soiled At discharge Between patients: all touch surfaces	ES Direct care staff	Patients on additional precautions should have a dedicated commode. After discharge cleaning, commode is flagged as 'clean', and stored in the designated 'clean' storage area.

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Computer and keyboard	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Exterior surfaces to be cleaned according to manufacturer's directions. Will be free of visible dust, soil, smudges and stains.	Daily When soiled At discharge (when located in patient room)	Unit aides/ ES	Plastic cover should be placed over keyboard and privacy screen over monitor All care providers should perform hand hygiene before using computer.
Cyclers (peritoneal dialysis)	LLD	Clean according to manufacturer's direction. Wipe all spills immediately.	When soiled Between patients	Unit aides/ biomedical personnel	
Diagnostic imaging portable machine portable – grid/film cassette mammography paddles	LLD	Clean according to manufacturer's direction. Clean all surfaces that have direct contact with patient and patient environment.	When soiled When patient on precautions Between patients if not covered Between patients	Technician	Cassette should ideally be covered (e.g., pillowcase) where appropriate.
Doppler's transducers Probes	LLD	Clean according to manufacturer's direction. Clean all surfaces that have direct contact with patient.	After each use After each use	Direct care staff	Wipe immediately after use to remove residual ultrasound gel before cleaning Probes that contact mucous membranes or non-intact skin require high level disinfection.

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Electrocardiogram machines machine and cables	CL – Routine LLD – Precaution	Clean according to manufacturer's direction.	Between patients	Direct care staff	
Examination table	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	All surfaces should always be visibly clean and free of blood and body substances.	When soiled Between patients Any cupboards incorporated into table design: on weekly-monthly basis dependent of frequency of use	ES Direct care staff ES	Integrity of the surface needs to be examined regularly and replaced if torn or damaged. Paper coverings do **not** eliminate the need for cleaning.
Feeding pump: when **not** connected to patient	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Clean according to manufacturer's directions.	Between patients	ES/ Reprocessing area	
Glucometer	LLD	Clean according to manufacturer's directions.	Between patients When soiled	Direct care staff/technician	**DO NOT USE HYDROGEN PEROXIDE.**

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Hydraulic lift portable (stand alone)	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Refer to manufacturer's directions. All parts should be visibly clean and free from blood and body substances, dirt and dust including ceiling tracks.	When soiled Between patients	ES Direct care staff	
ceiling mounted			Daily: high touch surfaces At discharge	ES	
slings	LLD Laundry		Between patients When soiled At discharge	Direct care staff Laundry	Should be dedicated to the patient if possible. Not to be used if visibly soiled.
Ice Machine exterior	CL LLD - Precautions	All surfaces should be visibly clean and free from dirt, dust, or stain.	Daily	ES	
interior			Every 6 months, as per manufacturer's schedule	Facilities Maintenance & Operations	Drain and thoroughly clean with a de-limer.
Intravenous (IV): when **not** connected to patient pumps, poles, warmers	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	In accordance with manufacturer's directions	When soiled Between patients	ES Biomedical personnel/ reprocessing area	

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Isolette	LLD	All parts should be visibly clean and free from blood and body substances, dust, and dirt.	When soiled Weekly At discharge	ES Direct care staff or biomedical personnel	**DO NOT USE PHENOLICS.**
Laryngoscope handle blade	 LLD HLD	Visibly clean and free from blood and body substances	 Between patients Between patients	 Direct care staff Reprocessing area	Disposables are recommended in community settings; discard if single use.
Linen carts	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	All surfaces should be visibly clean and free of dust, dirt, and adhesive tape. Linen bags should be changed daily and at request if increased amount of laundry.	Daily Precaution linen hampers in patient room: daily and at discharge	ES	Precaution linen hampers are marked 'clean' and stored in designated 'clean' storage area after discharge clean.
Measuring containers (urine) single patient use multiple patient use	 CL LLD	All parts should be visibly clean with no blood or bodily substances, dust or dirt.	 After each use At discharge After each use	 Direct care staff Direct care staff/ Reprocessing area	Put through unit washer/disinfector after each use. Preferable to have one container per patient, labelled with name.

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Medication carts/dispensers exterior interior	 CL LLD - Precautions	Refer to manufacturer's directions. All surfaces should be visibly clean and free from dirt and dust.	 Daily Monthly: cycled When soiled	 ES Pharmacy technician: dispenser units	All surfaces should be kept clear to allow for daily cleaning. Food and beverages should not be placed on top. Should not take into bed space if patient on precautions.
Ophthalmoscope	LLD	All surfaces should be visibly clean and free from dirt and dust.	Between patients	Direct care staff	
Otoscope handle ear speculum otoacoustic emission (OAE) screening tips	 LLD Disposable or HLD Disposable or HLD	Refer to manufacturer's directions.	 Between patients Between patients Between patients	 Direct care staff MDRD (for HLD) MDRD (for HLD)	 Discard if single use
Oximeter Probes	LLD	Refer to manufacturer's directions.	Between patients	Direct care staff	Discard if single use
Pillow	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Should be visibly clean and free from blood and bodily substances, hair, or stains.	Daily When soiled At discharge Between patients	ES Direct care staff	Discard if torn

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Phone	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Should be visibly clean and free from dust	Daily When soiled At discharge (if in patient room) Between patients (if mobile)	ES Direct care staff	
Personal Protective Equipment storage units	LLD	Visibly clean and free from blood and bodily fluids, dust, dirt, or adhesive tape	Daily: exterior At discharge: exterior and interior	ES	If portable unit, once discharge cleaned, tag unit as 'clean' and store in designated 'clean 'area.
Pneumatic tube systems carrier station cylinder	 CL CL	Wipe exterior. Visibly clean and free from blood or bodily fluids, smudges, or dust. Wipe exterior and interior surfaces.	Daily When soiled, and quarterly	 ES	There should be facility policies regarding what can be transported in pneumatic tube systems, and how it should be packaged.
Reflex hammer	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Visibly clean	Between patients	Direct care staff	
Restraints	CL LLD	Visibly clean and free from blood or bodily fluids.	When soiled At discharge Between patients	Laundry Direct care staff	
Scales adult diaper newborn	 CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	 All surfaces should be visibly clean and free from blood, body fluids, dirt, or dust	Daily When soiled After each use: surfaces that touch patient	ES Direct care staff	

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Stretcher	LLD	All surfaces should be visibly clean and free from blood, body fluids, dirt, dust, or adhesive tape.	Between patients At discharge When soiled	Direct care staff/porters ES	Paper coverings do **not** eliminate the need for cleaning.
Suction bottles/machines exterior bottle Interior	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled Disposable	Surfaces should be visibly clean.	Daily When soiled At discharge	ES Direct care staff	Remove disposable portions, snap closed, discard and replace with new interior.
Table bedside, over bed	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	All surfaces should be visibly clean and free from blood, body fluids, dust, dirt, spills.	Daily When soiled At discharge	ES	The underside of the over bed table is a high-touch area.
Telemetry equipment monitor and cables	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	Refer to manufacturer's directions.	When soiled Between patients	Unit Aides Technicians	
Transfer Boards	LLD	Wipe all surfaces immediately after use.	After each use	Direct care staff	

Item	Minimum Intensity	Cleaning Expectations and Standards	Minimum Frequency	Suggested Responsibility	Remarks
Transport equipment wheelchairs, walkers	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled	All parts including underside of surfaces should be visibly clean and free from blood and bodily substances, dust, or dirt.	When soiled At discharge: when dedicated to one patient Between patients	ES Physio aides Physio aides Direct care staff	Pay special attention to cleaning the high touch areas: arm rests, seats, back support, brake handles, and push handles.
Ultrasound transducers handle and cable external	LLD	Clean according to manufacturer's direction. Clean all surfaces that have direct contact with patient.	Between patients	Direct care staff	Wipe gel off immediately after use and before cleaning. Use HLD for transducer probes if they touch mucous membranes or non-intact skin
Vacutainer holder	LLD	Discard if visibly soiled	Between patients	Direct care staff	Single patient use preferred
Workstation on wheels (e.g. computers on wheels, ECG machines, ultrasound machines, , lab carts)	CL: moderate/high risk LLD: high/very high risk, precautions, visibly soiled LLD	Visibly clean and free from blood, body fluids, dust or dirt	Daily and discharge (if in patient room) Between patients	ES Direct care staff	Pay special attention to high touch areas (keyboard, mouse). Should not go into bed space if patient is on precautions.

14. Appendix H: Examples of Protocols for Cleans

H-1 General Cleaning Practices for All Healthcare Settings

Before cleaning:

- Check for additional precautions signs. If none, follow these steps.
- Remove clutter before cleaning.
- Follow the manufacturer's instructions for proper dilution and contact time for cleaning and disinfecting solutions. Clean hands.
- Gather materials required for cleaning before entering the room.
- Clean hands and put on gloves on entering the room.

During cleaning:

- Progress from clean to dirty and from high surfaces to low surfaces.
- Remove visible soil prior to cleaning and disinfection.
- Dry mop prior to wet/damp mop.
- Minimize turbulence to prevent the dispersion of dust that may contain microorganisms.
- Never shake mops.
- Do not 'double-dip' cloths. Do not put used cloth back into the solution.
- Change cloths/mop heads frequently.
- Change cleaning solutions as per manufacturer's instructions. Change more frequently in heavily contaminated areas, when visibly soiled and immediately after cleaning blood and body fluid spills.
- Containers for liquid soap, cleaners/disinfectants are disposable. The practice of 'topping up' is not acceptable, since it can result in contamination of the container and solution.
- Vacuum carpets using vacuums fitted with a HEPA or micron filter.
- Be alert for needles and other sharp objects. Pick up sharps using a mechanical device and place into sharps container. Report incident to supervisor.
- Collect waste, handling plastic bags from the top (do not compress bags with hands).
- Remove gloves and put in waste bag.
- Clean hands on leaving the room.

After cleaning:

- Do not overstock rooms.
- Tools used for cleaning and disinfecting should be cleaned and dried between uses.
- Launder mop heads daily. All washed mop heads should be dried thoroughly before re-use.
- Clean ES cart and carts used to transport waste daily.

H-2: Sample Procedure for Routine Daily Clean of Patient Room (patient NOT on Additional Precautions)

1. **Assessment**
   - Check for additional precautions signs. If none, follow these steps.
   - Walk through room to determine what needs to be replaced (e.g., toilet paper, paper towels, soap, alcohol-based hand rub (ABHR), gloves, sharps container) and whether any special materials are required; this may be done before or during the cleaning process.
2. **Assemble supplies**
   - Ensure an adequate supply of clean cleaning cloths is available.
   - Dispense/prepare fresh solution according to manufacturer's instructions using appropriate PPE specified on the MSDS.

H-2: Sample Procedure for Routine Daily Clean of Patient Room (patient NOT on Additional Precautions)

3. **Clean hands and put on gloves. If there are spills or visible soil, other PPE may be required.**
4. **Remove soiled items from patient room (and adjoining bathroom)**
   - Check sharps container and change when three-quarters full (do not dust the top of a sharps container).
   - Check privacy curtains for visible soiling and remove if soiled.
   - Remove any soiled linen and place in laundry bag, remove bag if full and stored in room.
   - Place obvious waste in receptacles, and remove garbage bag.
5. **Remove gloves and clean hands with ABHR; if hands are visibly soiled, wash with soap and water.** Depending on facility protocols and risk category for the area, this type of clean is completed using a cleaning detergent, two-step process using a cleaning detergent followed by a disinfectant, or using a combined cleaning detergent/disinfectant. If there is visible soiling, then a two-step process is required regardless of the product used.
6. **Put on clean gloves.**
7. **Clean room, working from clean to dirty and high to low areas of the room:**
   - Use fresh cloth(s) for cleaning *each* patient bed space:
     - if a bucket is used, do not 'double-dip' cloth(s)
     - do not shake out cloth(s)
     - change the cleaning cloth when it is no longer saturated with disinfectant
     - if there is more than one patient bed space in the room, use clean cloth(s) for each and complete the cleaning in each bed space before moving to the next; in multi-bed rooms, remove gloves and clean hands at the completion of each bed space
     - after cleaning one heavily soiled items, prior to cleaning another heavily soiled item (these should be cleaned last in a room)
   - Start by cleaning doors, door handles, push plate and touched areas of frame.
   - Check walls for visible soiling and clean if required.
   - Clean light switches and thermostats.
   - Clean wall mounted items such as alcohol-based hand rub dispenser and glove box holder.
   - Check and remove fingerprints and soil from low level interior glass partitions, glass door panels, mirrors and windows with glass cleaner.
   - Clean all furnishings and horizontal surfaces in the room including chairs, window sill, television, telephone, computer keypads, night table and other tables or desks. Lift items to clean the tables. Clean the over-bed table, including the underside which touches the patient's blankets. Pay particular attention to high-touch surfaces.
   - Wipe equipment on walls such as top of suction bottle, intercom and blood pressure manometer as well as IV pole.
   - Clean bedrails, bed controls and call bell.
   - Clean waste bins.
   - Clean bathroom/shower (see **bathroom cleaning procedure**).
   - Clean floors (see **floor cleaning procedure**).
8. **Remove gloves and clean hands with ABHR; if hands are visibly soiled, wash with soap and water. DO NOT LEAVE ROOM WEARING SOILED GLOVES.**
9. **With clean hands (gloves are not required) replenish supplies as required**
10. **Clean hands with ABHR upon leaving room**

H-3: Sample Procedure for Routine Bathroom Clean

1. **Assessment and assembling of supplies**
   - This step is done in conjunction with assessing the room.
2. **Clean hands and put on gloves.**
3. **Remove any soiled items from bathroom (done in conjunction with patient room).**
   - Check sharps container and change when three-quarters full (do not dust the top of a sharps container).
   - Check privacy curtains for visible soiling and remove if soiled.
   - Remove any soiled linen and place in laundry bag, remove bag if full and stored in room.
   - Place obvious waste in receptacles, and remove garbage bag.
4. **Remove gloves, clean hands, and put on new gloves (Clean patient room first before bathroom - see H-2).**
   - In a single room, the bathroom is seen as an extension of the bedroom, so this step is not required.
   - In a multi-bed room, gloves are removed after the last bed space is completed, hands are cleaned, and new gloves are put on to clean the bathroom.
5. **Clean room, working from clean to dirty and high to low areas of the room:**
   - Clean door handle and frame, light switch.
   - Clean chrome wall attachments.
   - Clean inside and outside of sink, sink faucets and mirror; wipe plumbing under the sink; rinse sink and dry fixtures.
   - Clean all dispensers and frames.
   - Clean call bell and cord.
   - Clean support railings, ledges/shelves.
   - Clean shower/tub faucets including soap dish, walls and railing, scrubbing as required to remove soap scum; inspect grout for mould; rinse and wipe dry; inspect and replace shower curtains monthly and as required.
   - Clean waste can.
   - Clean bedpan support and/or seat raiser, entire toilet including handle and underside of flush rim.
6. **Remove gloves and clean hands with ABHR; if hands are visibly soiled, wash with soap and water.**
7. **With clean hands (gloves are not required) replenish supplies as required (e.g., ABHR, soap, paper towels, garbage bags).**
8. **Clean hands with ABHR upon leaving room.**

H-4: Sample Procedure for Mopping Floors using Dry Dust Mop

Working from clean areas to dirty areas:

- Floors are cleaned after all the bed spaces and bathroom in a patient room have been cleaned.
- Remove debris from floor and dry any wet spots with paper towel.
- Remove gum or other sticky residue from floor.
- Starting in the furthest corner of the room, drag the mop toward you, then push it away, working in straight, slightly overlapping lines and keeping the mop head in full contact with the floor.

H-4: Sample Procedure for Mopping Floors using Dry Dust Mop

- Do not lift dust mop off the floor once you have started, use swivel motion of frame and wrist to change direction.
- Move furniture and replace after dust mopping, including under and behind bed.
- Carefully dispose of debris, being careful not to stir up dust.
- Replace the mop head/pad every 4 patient rooms and when heavily soiled; and after every room where patient is on precautions.
- Remove gloves and perform hand hygiene.

H-5: Sample Procedure for Mopping Floors using Wet Loop Mop and Bucket

Working from clean areas to dirty areas:

- Floors are cleaned after all the bed spaces and bathroom in a patient room have been cleaned.
- Prepare fresh cleaning solution according to the manufacturer's instructions using appropriate PPE specified on the MSDS.
- Place 'wet floor' caution sign outside of room or area being mopped.
- Immerse mop in cleaning solution and wring out.
- Push mop around baseboards first, paying particular attention to removing soil from corners; avoid splashing walls or furniture.
- In open areas use a figure eight stroke, overlapping each stroke; turn mop head over every five or six strokes.
- Mop a three metre by three metre (nine feet by nine feet) area, then rinse and wring mop
- Repeat until entire floor is done.
- Change the mop head every four patient rooms and when heavily soiled; and after every room where patient is on precautions.
- Change cleaning solution frequently enough to maintain appropriate concentration of solution – same time as mop head change.

H-6: Sample Procedure for Mopping Floors using a Microfibre Mop

Working from clean areas to dirty areas:

- Floors are cleaned after all the bed spaces and bathroom in a patient room have been cleaned.
- Prepare fresh cleaning solution according to the manufacturer's instructions using appropriate PPE specified on the MSDS.
- Place 'wet floor' caution sign outside of room or area being mopped.
- Fill plastic basin with cleaning solution.
- Place microfibre pad(s) to soak in basin.
- Take a clean pad from the basin, wring out and attach to mop head using Velcro strips.
- Remove pad when soiled and set aside for laundering.
- Use a fresh microfibre pad for each room.
- Send soiled, reusable microfibre pads for laundering at the end of the day.

H-7: Cleaning Methods for Carpet			
Method	**Process**	**Advantages**	**Disadvantages**
Bonnet cleaning	Moistened rayon, cotton, and/or polypropylene pad is attached to a rotary shampoo machine and is used to agitate and aid in suspension of soils which are absorbed into the bonnet pad.	・ rapid drying (uses minimum moisture) ・ easy to learn and perform ・ good interim method to improve carpet appearance ・ less wicking ・ low equipment cost	・ limited capability for soil removal ・ rayon pads may not be totally effective ・ requires vacuuming post-cleaning ・ may result in soil build-up and grinding of dirt deeper into ・ the pile ・ spinning bonnet may distort pile or damage the edges of some carpet tiles ・ should not be used on cut- ・ pile carpet ・ interim carpet cleaning method only, should not be used as the only cleaning
Dry extraction	Pre-moistened powder is sprinkled onto carpet and brushed into the pile. A vacuum cleaner is then used to remove the powder and the soil that has attached to the compound.	・ lowest moisture cleaning method ・ dry extraction compounds are ・ safe for all types of carpet ・ may be used as interim or primary cleaning method ・ little disruption of normal activities ・ area may be used immediately after cleaning ・ good for high traffic areas that cannot be closed down for cleaning	・ powder may require 20-30 minutes drying time before vacuuming ・ powder may build-up in carpet
Dry foam cleaning	An aerator whips the cleaning solution into foam which is then dispensed into the horizontally rotating brushes. Shampoo and soil are then removed using the machine's extraction system (if built-in) or a wet/dry vacuum.	・ low moisture ・ rapid drying ・ very effective in removing dust mite and mould allergens ・ cleaning results are excellent	・ detergent is difficult to ・ remove, contributing to rapid re-soiling
Hot water extraction (steam cleaning)	A pressurized hot water flow mixed with a detergent solution is injected into the carpet pile and is instantaneously removed from the fibre together with soil using a powerful vacuum.	・ easy to learn ・ excellent extraction of soil from deep in the carpet pile ・ effective in removing other contaminants	・ time-consuming, as many passes of the vacuum may be required for heavily soiled areas ・ requires lengthy dry time ・ following extraction (6-12 hours) ・ uses large amounts of ・ cleaning solution

H-7: Cleaning Methods for Carpet			
Method	**Process**	**Advantages**	**Disadvantages**
Shampooing	Cleaning solution is applied directly to carpet or, if equipped with a dispenser, added to solution tank. The solution is then worked into the carpet pile using the rotary brush machine. Hot water extraction and rinsing is required following cleaning. Some machines combine shampooing with hot water extraction in the same machine.	・ rotary brushes offer excellent agitation to remove ・ imbedded and suspended ・ soils	・ may take some time to master various techniques ・ time-consuming ・ requires dry time following extraction ・ detergent is difficult to remove, contributing to rapid re-soiling

H-8: Sample Procedure for Routine Discharge Clean of a Patient Room and Bathroom (Patient NOT on Additional Precautions)

1. **Assessment**
   - Check for additional precautions signs. If none, follow these steps.
   - Walk through room to determine what needs to be replaced (e.g., toilet paper, paper towels, soap, alcohol-based hand rub [ABHR], gloves, sharps container) and whether any special materials are required; this may be done before or during the cleaning process.
2. **Assemble supplies**
   - Ensure an adequate supply of clean cleaning cloths is available.
   - Dispense/prepare fresh disinfectant solution according to manufacturer's instructions using appropriate PPE specified on the MSDS.
3. **Clean hands and put on gloves. If there are spills or visible soil, other PPE may be required.**
4. **Remove soiled and used items in bed space/patient room (and bathroom in private room):**
   - Check sharps container and change when three-quarters full.
   - Check privacy and window curtains for visible soiling and replace if required; in residential care facilities, remove curtain.
   - Remove the bed linen by rolling it into the centre of the bed and then place in laundry bag being careful to prevent aerosols.
   - If multiple beds in a multi-bed room, remove bed linen for all beds.
   - Remove laundry bag if stored in the room.
   - Remove all waste material and place in bag, remove bag from bin
   - Remove gloves and clean hands.
5. **Remove gloves and clean hands with ABHR; if hands are visibly soiled, wash with soap and water.** Depending on facility protocols and risk category for the area, this type of clean is completed using a cleaning detergent, two-step process using a cleaning detergent followed by a disinfectant, or using a combined cleaning detergent/disinfectant. If there is visible soiling, then a two-step process is required regardless of the product used.
6. **Put on clean gloves and clean room, working from clean to dirty and from high to low areas of the room:**
   - Use fresh cloth(s) for cleaning *each* patient bed space:

H-8: Sample Procedure for Routine Discharge Clean of a Patient Room and Bathroom (Patient NOT on Additional Precautions)

  - if a bucket is used, do not 'double-dip' cloth(s)
  - do not shake cloth(s)
  - change the cleaning cloth when it is no longer saturated with disinfectant
  - if there is more than one patient bed space in the room, use clean cloth(s) for each and complete the cleaning in each bed space before moving to the next
  - in multi-bed rooms, remove gloves and clean hands at the completion of each bed space
  - after cleaning one heavily soiled items, prior to cleaning another heavily soiled item (these should be cleaned last in a room)
- Start by cleaning doors, door handles, push plate, and touched areas of frame.
- Check walls for visible soiling and clean if required; remove tape from walls, clean stains.
- Clean light switches and thermostats.
- Clean wall mounted items (e.g., ABHR dispenser, glove box holder, top of suction bottle, intercom, blood pressure manometer).
- Check and remove fingerprints and soil from low level interior glass partitions, glass door panels, mirrors, and windows.
- Clean all furnishings and horizontal surfaces in the room including chairs, window sill, television, telephone, computer keypads, night table, and other tables or desks. Lift items to clean the tables. Clean the underside of the over-bed table. Pay particular attention to high-touch surfaces.
- Clean equipment (e.g., IV pole and pump, walkers, commodes, wheelchairs).
- Clean inside and outside of patient cupboard or locker.

7. Clean the bed

- Clean top and sides of mattress, turn over and clean underside.
- Clean exposed bed springs and frame.
- Check for cracks or holes in mattress and have mattress replaced as required.
- Inspect for pest control and initiate facility process if applicable.
- Clean headboard, foot board, bed rails, call bell and bed controls; pay particular attention to areas that are visibly soiled and surfaces frequently touched by staff.
- Clean all lower parts of bed frame, including casters.
- Allow mattress to dry.

Clean bathroom/shower

8. Remove gloves, clean hands, and put on new gloves (unless single patient room)

9. Clean room, working from clean to dirty and high to low areas of the room:

- Clean door handle and frame, light switch.
- Clean chrome wall attachments.
- Clean inside and outside of sink, sink faucets and mirror; wipe plumbing under the sink; rinse sink and dry fixtures
- Clean all dispensers and frames.
- Clean call bell and cord.
- Clean support railings, ledges/shelves.
- Clean shower/tub faucets including soap dish, walls and railing, scrub shower walls; inspect grout for mould; rinse and wipe dry; inspect and replace shower curtains monthly and as required.
- Clean waste can.

H-8: Sample Procedure for Routine Discharge Clean of a Patient Room and Bathroom (Patient NOT on Additional Precautions)

- Clean bedpan support and/or seat raiser, entire toilet including handle and underside of flush rim.

Clean floors (in same manner as for Routine Daily Clean)

10. **Remove gloves and clean hands with ABHR; if hands are visibly soiled wash with soap and water. DO NOT LEAVE ROOM OR REMAKE BED OR REPLENISH SUPPLIES WEARING SOILED GLOVES.**
11. **With clean hands (gloves are not required) remake bed and replenish supplies as required (e.g., gloves, ABHR, soap, paper towels, clean waste bag in waste bin).**
12. **Tag cleaned equipment as "clean" and return it to the designated clean area or to the equipment depot.**
13. **Clean hands with ABHR upon leaving room.**

H-9: Sample Procedure for Additional Precaution Clean of a Patient Room and Bathroom

Difference from Routine Daily Clean:
This type of clean is completed using a two-step process using a cleaning detergent followed by a disinfectant when all surfaces are dry, or using a combined cleaning detergent/disinfectant, and ensuring that the disinfectant has sufficient contact time as identified by the manufacturer. If there is visible soiling, then a two-step process is required regardless of the product used.

- The solution and mop head (dust mop and wet mop) are changed once the room is completely cleaned; new solution and mop head for each room.
- Surfaces and handles of isolation cart, portable or built-in isolation storage bar are cleaned and disinfected.

1. **Assessment**
   - Check for additional precautions signs, and use the PPE identified on the sign.
   - While cleaning the room, determine what needs to be replaced (e.g., toilet paper, paper towels, soap, alcohol-based hand rub (ABHR), gloves, sharps container) and whether any special materials are required.
2. **Assemble supplies**
   - Ensure an adequate supply of clean cleaning cloths is available
   - Dispense/prepare fresh solution according to manufacturer's instructions using appropriate PPE specified on the MSDS.
3. **Clean hands and put on PPE.**
4. **Remove soiled items from patient room (and adjoining bathroom)**
   - Check sharps container and change when three-quarters full (do not dust the top of a sharps container).
   - Check privacy curtains for visible soiling and remove if soiled.
   - Remove any soiled linen and place in laundry bag, remove bag if full and stored in room.
   - Place obvious waste in receptacles, and remove garbage bag.
5. **Remove gloves and clean hands with ABHR; if hands are visibly soiled, wash with soap and water.**
6. **Put on clean gloves.**

7. Clean room, working from clean to dirty and high to low areas of the room:

- Use fresh cloth(s) for cleaning *each* patient bed space:
  - if a bucket is used, do not 'double-dip' cloth(s)
  - do not shake out cloth(s)
  - change the cleaning cloth when it is no longer saturated with disinfectant
  - if there is more than one patient bed space in the room, use clean cloth(s) for each and complete the cleaning in each bed space before moving to the next; in multi-bed rooms, remove gloves and clean hands at the completion of each bed space
  - after cleaning one heavily soiled items, prior to cleaning another heavily soiled item (these should be cleaned last in a room)
- Start by cleaning doors, door handles, push plate and touched areas of frame.
- Check walls for visible soiling and clean if required.
- Clean light switches and thermostats.
- Clean wall mounted items such as alcohol-based hand rub dispenser and glove box holder
- Check and remove fingerprints and soil from low level interior glass partitions, glass door panels, mirrors, and windows with glass cleaner.
- Clean all furnishings and horizontal surfaces in the room including chairs, window sill, television, telephone, computer keypads, night table and other tables or desks. Lift items to clean the tables. Clean the over-bed table, including the underside which touches the patient's blankets. Pay particular attention to high-touch surfaces.
- Wipe equipment on walls such as top of suction bottle, intercom and blood pressure manometer as well as IV pole.
- Clean bedrails, bed controls and call bell.

Clean bathroom/shower

8. Remove gloves, clean hands, and put on new gloves (unless single patient room).

9. Clean room, working from clean to dirty and high to low areas of the room:

- Clean door handle and frame, light switch
- Clean chrome wall attachments
- Clean inside and outside of sink, sink faucets and mirror; wipe plumbing under the sink; rinse sink and dry fixtures
- Clean all dispensers and frames
- Clean call bell and cord
- Clean support railings, ledges/shelves
- Clean shower/tub faucets including soap dish, walls and railing, scrub shower walls; inspect grout for mould; rinse and wipe dry; inspect and replace shower curtains monthly and as required
- Clean waste can
- Clean bedpan support and/or seat raiser, entire toilet including handle, and underside of flush rim

Clean floors (in same manner as for Routine Daily Clean)

10. 10. Remove PPE* inside room, discard in waste bag; close and tie bag, use alcohol-based hand rub or wash hands with soap and water if visibly soiled. DO NOT LEAVE ROOM WEARING SOILED PPE.

11. Gather supplies required, put on clean PPE*, and replenish supplies.

12. Remove PPE as noted in #10, clean hands upon leaving room.

*** If precaution signage indicates airborne precautions, N95 respirator is kept on until outside room. Clean N95 respirator should be worn while remaking the bed and restocking the room. Keep door closed.**

H-10: Sample Procedure for Enhanced Daily Clean of a Patient Room and Bathroom

Difference from *Additional Precaution Clean of a Patient Room and Bathroom*:

- This type of clean occurs twice daily.
- The first clean and disinfection follows the process identified in Additional Precaution Clean of a Patient Room and Bathroom; the second clean and disinfection occurs approximately 6-8 hours later and focuses on the high touch surfaces in the patient room and bathroom including commode if in use.
- All high-touch items and areas throughout the care unit/department (inclusive of hallways, nursing station/pod, dirty utility room) are cleaned and disinfected twice daily.

Follow all steps as identified in ***Additional Precaution Clean of a Patient Room and Bathroom***

H-11: Sample Procedure for Additional Precaution Discharge Clean

Difference from Routine Discharge Clean:
This type of clean is completed using a two-step process using a cleaning detergent followed by a disinfectant when all surfaces are dry, or using a combined cleaning detergent/disinfectant; ensuring sufficient contact time for the disinfectant as identified by the manufacturer. If there is visible soiling, then a two-step process is required regardless of the product used.

- The solution and mop head (dust mop and wet mop) are changed once the room is completely cleaned; new solution and mop head for each room.
- Surfaces, handles and drawers of isolation cart, portable or built-in isolation storage bar are cleaned and disinfected, then tagged as clean and stored in designated clean area or equipment depot.

1. Assessment and removal of items and supplies (in conjunction with bathroom)

- Check for additional precautions signs, and use the PPE identified on the sign.
- Bring isolation cart or portable isolation equipment storage bar into patient room.
- Check sharps container and change when three-quarters full.
- Remove all dirty/used items (e.g., suction container, disposable items, including from isolation cart/storage bar).
- Remove the bed linen by rolling it into the centre of the bed and then place in laundry bag being careful to prevent aerosols.
- If multiple beds in a multi-bed room, remove bed linen for all beds.
- Remove curtains (privacy, window, shower).
- Discard bar soaps, toilet paper, glove box, paper towels (unless in a closed system).
- Place obvious waste in receptacles and remove garbage bag.
- Determine what needs to be replaced and whether any special materials are required.
- Remove PPE and discard in garbage bag; do hand hygiene.

H-11: Sample Procedure for Additional Precaution Discharge Clean

2. Assemble supplies
- Ensure an adequate supply of clean cleaning cloths is available.
- Dispense/prepare fresh disinfectant solution according to manufacturer's instructions using appropriate PPE specified on the MSDS.

3. Clean hands and put on PPE.

4. Clean room, working from clean to dirty and from high to low areas of the room:
- Use clean cloth(s) for cleaning *each* patient bed space:
  - if a bucket is used, do not 'double-dip' cloth(s)
  - do not shake cloth(s)
  - change the cleaning cloth when it is no longer saturated with disinfectant
  - if there is more than one patient bed space in the room, use clean cloth(s) for each and complete the cleaning in each bed space before moving to the next
  - in multi-bed rooms, remove gloves and clean hands at the completion of each bed space
  - remove gloves and clean hands after cleaning one heavily soiled item, prior to cleaning another heavily soiled item (these should be cleaned last in a room)
- Start by cleaning doors, door handles, push plate and touched areas of frame.
- Check walls for visible soiling and clean if required; remove tape from walls, clean stains
- Clean light switches and thermostats.
- Clean wall mounted items (e.g., ABHR dispenser, intercom, blood pressure manometer).
- Check and remove fingerprints and soil from low level interior glass partitions, glass door panels, mirrors and windows.
- Clean all furnishings and horizontal surfaces in the room including chairs, window sill, television, telephone, computer keypads, night table and other tables or desks. Lift items to clean the tables. Clean the underside of the over-bed table. Pay particular attention to high-touch surfaces.
- Clean equipment (e.g., IV pole and pump, walkers, commodes, wheelchairs, isolation cart/storage bar).
- Clean inside and outside of patient cupboard or locker.

5. Clean the bed
- Clean top and sides of mattress, turn over and clean underside.
- Clean exposed bed springs and frame.
- Check for cracks or holes in mattress and have mattress replaced as required.
- Inspect for pest control and initiate facility process if applicable.
- Clean headboard, foot board, bed rails, call bell and bed controls; pay particular attention to areas that are visibly soiled and surfaces frequently touched by staff.
- Clean all lower parts of bed frame, including casters.
- Allow mattress to dry.

Clean bathroom/shower

6. Remove gloves, clean hands, and put on new gloves (unless single patient room).

7. Clean bathroom, working from clean to dirty and high to low areas of the room:
- Clean door handle and frame, light switch.
- Clean chrome wall attachments.
- Clean inside and outside of sink, sink faucets and mirror; wipe plumbing under the sink; rinse

H-11: Sample Procedure for Additional Precaution Discharge Clean

sink and dry fixtures.
- Clean all dispensers and frames.
- Clean call bell and cord.
- Clean support railings, ledges/shelves.
- Clean shower/tub faucets including soap dish, walls and railing, scrub shower walls; inspect grout for mould; rinse and wipe dry.
- Clean waste can.
- Clean bedpan support and/or seat raiser, entire toilet including handle and underside of flush rim.
- Discard toilet brush/swab.

Clean floors (in same manner as for Routine Daily Clean)

8. **Remove PPE* inside room, discard in waste bag; close and tie bag, and use alcohol-based hand rub or wash hands with soap and water if visibly soiled. DO NOT LEAVE ROOM OR REMAKE BED OR REPLENISH SUPPLIES WEARING SOILED PPE**
9. **With clean hands (gloves and other PPE* are not required) remake bed and replenish supplies as required (e.g., gloves, ABHR, soap, paper towels, clean waste bag in waste bin)**
10. **Replace curtains with clean curtains**
11. **Tag cleaned equipment as "clean" and return it to the designated clean area**
12. **Remove precaution sign*, clean and disinfect, place in designated storage area. Clean hands with ABHR upon leaving room**

*** If airborne precautions, N95 respirator is kept on until outside room. Clean N95 respirator is worn while remaking the bed and restocking the room. Door is closed and precaution sign is not removed until sufficient air changes have occurred.**

H-12: Sample Procedure for Additional Precaution Discharge Clean When Additional Precautions are Discontinued and Patient Remains in Hospital

When plans are being made to discontinue additional precautions for a patient and IPAC has identified the need for this type of clean, notification to ES staff is required and a collaborative and coordinated approach is followed:

Direct Care Staff – preparation of room:
- Arrange for as many items of the patient's personal belongings to be taken home by family (where possible).
- Remove and bag all of the remaining patient belongings.
- Discard any opened medical supplies.
- Empty and remove suction bottles, oxygen therapy equipment, discard IV bags and tubing, discard urinary catheter collection bags, unless still connected to patient.
- Remove bedpans/urinals/washbasins and put through washer/disinfector cycle.

Direct Care Staff – preparation of patient:
- Patient is showered/bathed if possible.
- Patient is helped into a clean gown/pyjamas and housecoat.

H-12: Sample Procedure for Additional Precaution Discharge Clean When Additional Precautions are Discontinued and Patient Remains in Hospital
• Patient performs hand hygiene and is brought out of the room. **Environmental Services Staff – cleaning and disinfection of room/bed space and bathroom** • follow all of the steps identified for an Additional Precaution Discharge Clean **[H-11]** • remove the additional precaution sign • clean and disinfect the sign, and store in designated location **Patient may return to the room/bed space.**
Developed by Vancouver Island Health Authority. Available at: http://www.viha.ca/NR/rdonlyres/18AA28E4-E3F1-4AE7-8A3F-E4EC3A18D5E5/0/ipcp_manual.pdf

H-13: Sample Procedure for Additional Precaution Daily Clean With Sporicidal of a Patient Room and Bathroom
Difference from *Additional Precaution Clean of a Patient Room and Bathroom*: • This type of clean requires the use of a sporicidal disinfectant. • This type of clean occurs **twice** daily. • The first clean and disinfection follows the process identified in Additional Precaution Clean of a Patient Room and Bathroom, the second clean and disinfection occurs approximately 6-8 hours later and focuses on the high touch surfaces in the patient room and bathroom including commode if in use.
Follow all steps as identified in ***Additional Precaution Clean of a Patient Room and Bathroom*** **[H-9]**

H-14: Sample Procedure for Additional Precaution Discharge Clean With Sporicidal of a Patient Room and Bathroom
Difference from *Additional Precaution Discharge Clean of a Patient Room and Bathroom*: • This type of clean requires the use of a sporicidal disinfectant.
Follow all steps as identified in ***Additional Precaution Discharge Clean of a Patient Room and Bathroom*** **[H-11]**

H-15: Sample Procedure for Cleaning a Blood or Body Fluid Spill

Preparation:

- Assemble materials required for dealing with the spill prior to putting on PPE.
- Inspect the area around the spill thoroughly for splatters or splashes.
- Restrict the activity around the spill until the area has been cleaned and disinfected and is completely dry.
- Put on gloves; if there is a possibility of splashing, wear a gown and facial protection (mask and eye protection or face shield).

Cleaning and Disinfecting:

- Confine and contain the spill. Wipe up any blood or body fluid spills immediately using either disposable towels or a product designed for this purpose. Dispose of materials by placing them into regular waste receptacle, unless the soiled materials are saturated and dripping with blood, in which case they shall be discarded into the biomedical waste container (i.e., yellow bag).
- Clean with a detergent and then disinfect the entire spill area with a hospital-grade disinfectant and allow it to stand for the amount of time recommended by the manufacturer.
- Wipe up the area again using disposable towels and discard into regular waste.
- Care should be taken to avoid splashing or generating aerosols during the clean up.

Completion:

- Remove gloves and other PPE, discard in regular waste, and perform hand hygiene.

Adapted from Health Canada's *Hand Washing, Cleaning, Disinfection and Sterilization in Health Care*, 1998 (p. 32) and Fallis, P. *Infection prevention and control in office-based healthcare and allied systems*, 2004.

H-16: Sample Procedure for Cleaning a Blood or Body Fluid Spill on Carpet

Preparation:

- Assemble materials required for dealing with the spill prior to putting on PPE.
- Restrict the activity around the spill until the area has been cleaned and disinfected and is completely dry.
- Put on gloves; if there is a possibility of splashing, wear a gown and facial protection (mask and eye protection or face shield).

Cleaning and Disinfecting:

- Mop up as much of the spill as possible using disposable towels.
- Clean with a detergent and disinfect the entire spill area with a hospital-grade disinfectant and allow it to stand for the amount of time recommended by the manufacturer.
- Safely dispose of the cleanup materials and gloves by placing them in the waste receptacle, unless the soiled materials are saturated and dripping with blood, in which case they shall be discarded into the biomedical waste container (i.e., yellow bag).

Completion:

- Remove gloves and other PPE, discard in regular waste, and perform hand hygiene.
- Arrange for the carpet to be cleaned with an industrial carpet cleaner as soon as possible.

NOTE: Carpeting is discouraged for areas where spills of blood or other body substances may be anticipated (e.g., procedure rooms, intensive care units). Carpeting, if used, should be easily removed and replaced (e.g., carpet tiles) if the procedure above is not effective.

Adapted from Department of Health, New South Wales. *Cleaning Service Standards, Guidelines and Policy for NSW Health Facilities*. 1996

H-17: Sample Procedure for Cleaning Commodes

Daily clean (dedicated to patient):

- Wipe the commode clean, working from the clean areas to the dirty areas.
  - start at the highest point on the commode and finish with the seat and pan area
  - work from the outside of the commode and then clean the parts that touch the patient; pay particular attention to the arm rests and the underside of the rim
  - clean ridges and awkward areas (i.e., foot rests)
- For greasy or stubborn soiling, use a non-abrasive pad.
- If soiled areas resist cleaning, then alternative cleaning techniques should be considered, such as automatic commode washers/or steam cleaning.

Scheduled clean (on discharge and at minimum monthly):

- Check for any torn or broken parts (report to appropriate department).
- Detach any removable parts and thoroughly clean all areas following the order noted above.
- Allow to dry.
- Clean and disinfect thoroughly.
- Flag as clean and store in the designated storage area.

If commode is used between patients, the care provider should:

- Clean and disinfect the commode thoroughly with a sporicidal disinfectant wipe, same as above.
- If commode is soiled, it should undergo a thorough clean with detergent and disinfectant before being used for next patient.

Adapted from the National Patient Safety Agency National Reporting and Learning Service's *The Revised Healthcare Cleaning Manual*, 2009

H-18: Sample Procedure for Cleaning Ice Machines

Daily:

- Visually inspect ice machines daily and report any signs of mould.
  - Ice scoop should be cleaned and disinfected at least once a day and more often if necessary
- Do not store food or other items in ice chests or machines.

Quarterly:

- Disconnect power supply to ice machine.
- Remove machine away from patient/resident care area.
- Remove and discard ice from bin.
- Allow unit to warm to room temperature.
- Disassemble removable parts of machine.
- Thoroughly clean machine and parts with water and detergent.
- Remove scale from machine components.
- Rinse components with fresh potable tap water.
- Clean ice storage chest or bin with fresh water and detergent; rinse with fresh potable tap water.
- Sanitize machine by circulating a 100 ppm solution of sodium hypochlorite through the ice-making and storage systems for two hours.
- Drain sodium hypochlorite solution and flush with fresh potable tap water.
- Allow all surfaces to air dry.
- Check for required repairs or maintenance (e.g., filter changes).

H-18: Sample Procedure for Cleaning Ice Machines
• Apply a label to the ice machine noting date of cleaning.
Adapted from: Sunnybrook Health Sciences Centre, Toronto, Ontario (policy II-Q-1200), revised 2007; and the Center for Disease Control's *Guidelines for Environmental Infection Control in Health-Care Facilities*, 2003.

H-19: Sample Procedure for Cleaning Toys
Between patients, clean, disinfect and rinse thoroughly: • toys that may be 'mouthed' (e.g., infant and toddler toys) **Daily clean with detergent and approved hospital-grade disinfectant:** • high-touch surfaces of shared electronic games (e.g., keyboards, joysticks) • high-touch surfaces of playhouses/climbers/rocking horses • high-touch surfaces in playrooms (e.g., tables, chairs, doorknobs) • Discard shared books, magazines, puzzles, cards and comics when visibly soiled and after use in rooms where the patient is on additional precautions. **Scheduled clean:** • toy storage bins/boxes/cupboards/shelves • all surfaces of playhouses/climbers
Adapted from CHICA-Canada's Practice Recommendations Toys, 2011 [available at: http://www.chica.org/pdf/Toys%20Practice%20Recommendations%202011.pdf]

H-20: Sample Procedure for Cleaning Washer/Disinfectors
Daily: • Visually inspect the interior to ensure that arms are freely moving, and water ports and drain areas are clear of any blockages. If issues, report to FMO. • Following manufacturer's recommendations on cleaning solutions, clean and disinfect the inside seal on door with a sporicidal disinfectant. • Clean and disinfect the exterior sides, front and handle areas. • Check washer detergent levels. If replacement is necessary, replace with full bottle and run machine through cycle. • Report any maintenance issues to appropriate department. **Quarterly (or as designated by the Manufacturer):** • Regular preventative maintenance
Adapted from: Vancouver Island Health Authority Infection Prevention and Control Manual, July 2012 [available at: http://www.viha.ca/NR/rdonlyres/18AA28E4-E3F1-4AE7-8A3F-E4EC3A18D5E5/0/ipcp_manual.pdf]

H-21: Sample Routine Environmental Cleaning in the Hemodialysis Unit

Nursing Staff

- Take only what is required for a patient's treatment into the hemodialysis station; minimize materials that cannot be easily decontaminated (e.g., patient chart).
- Dedicate equipment to individual patients whenever possible.
- Clean and disinfect equipment before returning it to a common clean area or for use on another patient (e.g., scissors, stethoscopes, blood pressure cuffs, electronic thermometers).
- Dispose of unused medications or supplies (e.g., syringes, alcohol swabs, tape) after each treatment.

Environmental Services Staff – after each hemodialysis treatment or procedure.
Allow sufficient time between patients for adequate cleaning.

- Clean any spills of blood as described in **H-15 or H-16.**
- Clean surfaces at the dialysis station, including the bed or chair, countertops, tables and external surfaces of the dialysis machine (including waste containers) and disinfect with a hospital-grade disinfectant, allowing sufficient contact time with the disinfectant.
- Remove waste, including biomedical waste and filled sharps containers; remove gloves; clean hands.
- Replace soap, paper towels, alcohol-based hand rub as required.

Environmental Services Staff – at end of day

- Clean remainder of the hemodialysis facility using a Routine Daily Clean. **[H-2]**
- Clean hand washing sinks.
- Mop floors.

Scheduled Cleaning

- Weekly clean eyewash stations, lights, tops of shelves, desks, file cabinets, chairs, baseboards, radiators, telephones weekly.
- Weekly deep cleaning of equipment and furnishings

Adapted from *Recommendations for Preventing Transmission of Infections Among Chronic Hemodialysis Patients*, MMWR April 27, 2001/50(RR05):p.17-22.

H-22: Sample Routine Environmental Cleaning in the Clinical Laboratory (Levels I and II)

Laboratory Staff

- Minimize storage of materials that are not pertinent to the work and cannot be easily decontaminated (e.g., journals, books, correspondence).
- Laboratory clothing should not be stored in contact with street clothing.
- Contaminated clothing should be decontaminated before laundering.
- Clean and decontaminate work surfaces with a hospital-grade disinfectant at end of the day and after any spill of potentially biohazardous material.
- Replace or repair work surfaces that have become permeable (i.e., cracked, chipped, loose) to biohazardous material.

Environmental Services Staff

- Clean hand washing sinks; mop floors
- Remove waste, including biomedical waste and filled sharps containers
- Remove gloves and clean hands
- Replace soap, paper towels, alcohol-based hand rub as required

H-22: Sample Routine Environmental Cleaning in the Clinical Laboratory (Levels I and II)

Scheduled Clean

- Clean eyewash stations, lights, tops of shelves, desks, file cabinets, chairs, baseboards, radiators, telephones weekly.

Adapted from Public Health Agency of Canada's *Laboratory Biosafety Guidelines*, 2004 and the Ontario Health-Care Housekeepers' Association Inc. *Cleaning Standards for Health Care Facilities*, 2008

H-23: Sample Routine Environmental Cleaning of Isolettes

Nursing Staff

- Detach medical gas lines and other external equipment from the isolette.
- Remove medical equipment from inside the isolette and disinfect or send for reprocessing.

Environmental Services Staff (this may be done by MDRD in some areas)
DO NOT USE PHENOLIC DISINFECTANTS.

- Check for items in the isolette, including sharps.
- Remove all items from inside the isolette.
- Remove grommets and door rings; clean and disinfect for required contact time.
- Remove tape from glass with alcohol, then wash off.
- Clean and disinfect glass.
- Detach all removable parts from inside of isolette, clean and disinfect, allowing sufficient contact time with the disinfectant.
- Clean outside of isolette completely, including wheels.
- Re-wash glass with a clean cloth dampened with water to remove any residue from disinfectant.
- Replace pieces of isolette.
- Tag isolette as clean, and store in designated clean area or equipment depot.

Preventive Maintenance

- Change filters every three months (or according to manufacturer's recommendations), when wet or if infant was on Contact Precautions.
- Humidity trays are reprocessed in central processing (MDRD) after use.

Adapted from Kingston General Hospital's Environmental Services Department, *Isolette Cleaning*, revised January 2009.

H-24: Sample Procedure for Cleaning Operating Rooms Between Cases

- Dispense/prepare disinfectant solution according to manufacturer's instructions.
- Collect and remove waste.
- Collect and remove all soiled linen.
- Remove gloves, clean hands, and put on new gloves.
- Clean and disinfect all horizontal surfaces that have come in contact with a patient or body fluids, including tops of surgical lights, blood pressure cuffs, tourniquets and leads ensuring appropriate contact times.
- Clean and disinfect suction canisters, reflective portion of surgical lights.
- Clean and disinfect bed.
- Clean electronic equipment (i.e., monitors) according to manufacturer's instructions (may be done

H-24: Sample Procedure for Cleaning Operating Rooms Between Cases
by Operating Room Aides). • Damp mop floor in a 1 to 1.3 metre (3 to 4 feet) perimeter around the bed (larger area if contamination present); use a separate mop head per case. • Spot clean walls. • Insert new waste liner bags. • When cleaning is complete, remove gloves and clean hands. • Place a cautionary 'Wet Floor' sign at the entrance to the room. **NOTE:** All equipment, such as x-ray machines and compressed gas, should be damp dusted before being brought into the OR and prior to leaving [cleaning responsibility should be identified: technician, OR aides, ES]. Doors are to be kept closed.
Adapted from the Operating Room Nurses Association of Canada (ORNAC) *Standards, Guidelines and Position Statements for Perioperative Registered Nursing Practice.* 10th Edition. Section 2, Infection Prevention and Control.

H-25: Sample Procedure for Terminal Cleaning Operating Rooms (End of Day)
• Dispense/prepare disinfectant solution according to manufacturer's instructions. Clean mop/mop head and solution is used for each room. • Collect and remove waste. • Collect and remove all soiled linen. • Remove gloves, clean hands and put on clean gloves. • Clean and disinfect lights and ceiling-mounted tracks. • Clean and disinfect all door handles, push plates, light switches and controls. • Clean and disinfect telephones and computer keyboard covers. • Clean and disinfect walls. • Clean and disinfect all exterior surfaces of machines and equipment (e.g., anaesthesia carts), allowing adequate drying time for the disinfectant before storage. • Clean and disinfect all furniture including wheels/casters. • Clean and disinfect exterior of cabinets and doors, especially around handles. • Clean and disinfect all horizontal surfaces. • Clean scrub sinks and surrounding walls. • Mop floor, making sure the bed is moved and the floor is washed underneath; move all furniture to the centre of the room and continue cleaning the floor; apply a sufficient amount of disinfectant to ensure that contact times are met. • Replace all furniture and equipment to its proper location. • Damp wipe waste receptacles, dry thoroughly and re-line. • Report any needed repairs. • Clean and store cleaning equipment. • Place a cautionary 'Wet Floor' sign at the entrance to the room. • Remove gloves and clean hands. • Doors are to be kept closed.
Adapted from the Operating Room Nurses Association of Canada (ORNAC) *Standards, Guidelines and Position Statements for Perioperative Registered Nursing Practice*. 10th Edition. Section 2, Infection Prevention and Control. 2011.

H-26: Sample Cleaning Schedule for Medical Device Reprocessing Departments and Other Sterile Storage Areas

Sterile Processing Areas

- Clean from clean to dirty, top to bottom.
- Clean all counters and floors daily; spot clean walls daily.
- Clean shelves daily in sterilization areas, preparation and packing areas and decontamination areas.
- Clean case carts after every use (this may be done by MDRD staff).
- Clean shelves every three months in sterile storage areas.
- Clean walls every six months.
- Clean light fixtures, sprinkler heads and other fixtures every six months.

User Units/Clinics, Endoscopy Suites and Other Sterile Storage Areas

- Clean counters and floors daily.
- Clean shelves monthly.
- Clean walls every six months.
- Clean light fixtures, sprinkler heads and other fixtures every six months.

Adapted from the Canadian Standards Association, Z314.3-09, *Effective Sterilization in Health Care Facilities by the Steam Process:* Table 1, Cleaning Frequencies.

H-27: Sample Procedure for Cleaning Patient Transport Vehicles (e.g. Ambulances)

Routine Clean Following Each Transport:

- Place garbage in appropriate waste container and empty as necessary.
- Place biomedical waste (e.g., dressings, bandages, contaminated sheets that are saturated with blood) in a clearly marked biohazardous waste bag.
- Carefully dispose of sharps that are found during cleaning in appropriate sharps container.
- Remove used linens/blankets for laundering.
- Clean and disinfect stretcher/mattress surfaces, surfaces in vehicle and equipment touched or used during the call; ensure contact time of the disinfectant is met.
- If the vehicle is heavily soiled/contaminated it should be taken out of service and deep cleaned.
- Remove gloves, clean hands.
- Place new linen on stretcher and restock vehicle as required (gloves are not required).

Daily Basis:

- Hose down the exterior of the vehicle, temperature permitting, to ensure that the reflective stripping is not covered in a coating of dirt which reduces its effectiveness as a safety feature.
- Inspect and clean the floors, walls, surfaces and interior glass of patient care compartment, as required.
- Clean and disinfect the steering wheel and door handles in the cab.

Scheduled Deep Cleans (schedule dependent on Risk Matrix Stratification):

Exterior of Vehicle

- Wash and dry the exterior of the vehicle, paying particular attention to the windows, mirrors, reflective strips, and emergency warning lights.

Driver's Compartment

- Remove all equipment, supplies, maps, and other easily removable devices from the front of the vehicle.
- Clean and vacuum seats, all equipment organizer locations, and floor.

H-27: Sample Procedure for Cleaning Patient Transport Vehicles (e.g. Ambulances)

- Clean and disinfect all interior surfaces, including walls, doors, radio equipment, dash and windows.

Patient Compartment

- Remove wall suction; assess if the sharps containers need to be replaced.
- Empty, clean and disinfect waste containers.
- Remove stretchers.
- Remove contents of cupboards and shelves.
- Remove stored bed linen and towels, put in laundry bag.
- Work from clean to dirty and top to bottom.
- Check interior lighting and vents and windows.
- Clean the sliding doors of the cupboards.
- Clean and disinfect all interior surfaces, including ceiling and walls and windows.
- Clean and disinfect chairs, bench seats, seat belts.
- Clean all straps used to hold equipment and supplies.
- Clean all doors and door handles.
- Sweep, vacuum, clean and disinfect floor; ensure that all dirt, stains, scuff marks are removed.

Equipment Storage Compartment

- Remove all equipment, sweep out compartment, and vacuum under matting if applicable.
- Clean and disinfect interior of compartment.

Jump Kits

- Remove all equipment and supplies from the kits.
- Clean all the debris from the interior of kit. If hard covered kits, clean and disinfect. If cloth, launder.

Equipment

- Clean and disinfect all equipment removed from cab, patient compartment, equipment storage and kits using the appropriate cleaner/disinfectant; inspect for damage; repair/replace as needed.
- Pay close attention to the cleaning and disinfection of stretchers – mattress, belts, and all parts of the metal frames need to be cleaned and disinfected; inspect for wear and damage; repair as needed; replace mattresses if ripped.
- Clean, disinfect and dry all hard surface containers holding supplies in cupboards or shelves; inspect for damage and expiration dates; discard as needed.

Getting Vehicle Service-Ready

- Once cleaning of all surfaces and equipment has been completed, remove PPE, perform hand hygiene.
- Ensure surfaces are dry before replacing equipment and restocking compartments.
- With clean hands (gloves are not required) replace all equipment back into the vehicle.
- Using an established check list, replenish stock in patient compartment cupboards and kits, ensuring the latest expiry date is at the back. Replace the sharps container in the Jump kits.
- Replace sharps container, waste bags, glove boxes, ABHR.
- Restock bed linen and towels (should be a one-day's supply only).
- Sign off on the clean; and follow established procedure to identify that vehicle is service-ready.

Adapted from the Policies, Procedures, Standard Operating Procedures, and Guidelines received through correspondence with: Alberta Health Services (not dated), Ottawa Paramedic Services (2009), Paramedic Services of the Corporation of the County of Simcoe(2011), Parkland Ambulance Prince Albert (2012), South Western Ambulance Service of the National Health Services Trust (2010).

H-28: Steps to Take for Infection Prevention and Control in the Event of a Flood

- Assess patient, visitor and staff safety; evacuate the area if required.
- Protect affected equipment with plastic sheeting or move if possible.
- Contain the flood if possible.
- In residential care facilities, report the incident to the facility manager.
- Notify Public Health if a food preparation or storage area is involved.
- Notify Infection Prevention and Control and Facilities Maintenance & Operations.
- Based on risk of contamination:
    - the ICP in consultation with Facilities Maintenance & Operations will determine the need for PPE, hoarding, negative/positive pressure requirements, etc.
    - ICP and OHS may be consulted regarding staff and patient safety
    - ICP will arrange for ongoing patient surveillance dependent on the patient population affected by the flood
    - ICP will recommend relocation of patients if required, dependent on patient population.
- Disinfect surfaces of equipment and furniture before moving it from the flood area.
- Following containment:
    - discard all contaminated single-use sterile supplies
    - send contaminated reusable sterile supplies to be reprocessed
    - remove and discard contaminated carpeting
    - assess furniture and equipment to determine if it can be salvaged
    - assess building materials (e.g., ceiling tiles, drywall) and remove if required
- Clean and sanitize the area → there should be proactive management of potential mould → ICP to provide direction to remediation company.

Adapted from Sunnybrook Health Sciences Centre's Emergency Response Plan Manual (last revised November 5, 2010)

15. Appendix I: Sample Environmental Cleaning Checklists and Audit Tools

Checklists

The use of checklists by staff when cleaning and disinfecting areas will ensure that all steps have been followed and allow for self-assessment and improvement. All of the steps involved in the cleaning process should be included in the checklist.

A checklist for an Additional Precaution with Sporicidal Discharge Clean has been included on the following page as an example.

Checklist for: Additional Precaution Discharge Clean With Sporicidal for C. *Difficile* Patient Room

Room: _____ Date: _____ Time: _____

Item	Yes	No	Comments/NA
1. Were all dirty/used items removed?			
a. Suction container and tubing			
b. All items at bedside removed, including:			
▪ IV bags			
▪ Tubes/lines/drains			
▪ Medications			
▪ Personal items			
▪ Toilet paper			
▪ Gauze			
▪ Tape			
▪ Patient's personal bar soap			
▪ Gloves			
2. Were the curtains removed before starting to clean?			
3. Were clean cloths, mop (all supplies) and fresh solutions used to clean the room?			
4. Was the correct disinfectant and concentration based on manufacturer's instructions used for cleaning? ▪ Sodium hypochlorite 1000 ppm, or ▪ Sodium hypochlorite 5000 ppm, or ▪ Hydrogen peroxide enhanced action formulation (HP-EAF) (4.5%), or ▪ Other sporicidal agents (has DIN number).			
5. If disinfection was with Sodium hypochlorite, was a pre-cleaning done with a detergent cleaner?			
6. Were pillow and mattresses cleaned and checked for tears (replaced if needed)?			
7. Were several cloths used to clean the room with NO double dipping of cloths into disinfectant?			
8. Was cleaning always done clean to dirty?			
9. Were all surfaces cleaned allowing for correct contact time of disinfectant solution as above?			
a. Mattress			
a. Pillow (material pillows to laundry)			
b. BP cuff			
c. Bedrails and bed controls			
d. Call bell			
e. Stethoscope and column			
f. Flow meters (medical gas controls)			
g. Suction tube and outer container (liner disposed)			
h. Over bed table			
i. Bedside table			
j. Locker or shelf for patient's personal items			

k. Inside drawers			
l. Bible			
m. TV remote control/TV controls			
n. Soap/alcohol base hand rub dispenser			
o. Door handles			
p. Light switches			
q. Bedside light cord			
r. Chair			
s. Telephone			
t. Television and TV handles			
u. Computers			
v. Wall mounted monitors (e.g. cardiac monitor)			
w. Pull cord in bathroom			
x. Sink, all washroom fixtures and toilet			
10. Were the following items cleaned and disinfected before use with another patient or before removing from bed space?			
a. Commode/high toilet seat			
b. Wheelchair			
c. Monitors			
d. IV poles/pumps			
11. If the sharps container was three-quarters full (or at full line) was it replaced?			
12. If there was a sheepskin used, was it sent to laundry or disposed?			
13. Was the lift mesh/sling sent to the laundry?			
14. Was the glove box discarded?			
15. Were all cleaning cloths returned to ES cart, placed in laundry or discarded after use?			

Environmental Services Supervisor signature: _____

Observational Audit Tools

Observational audit tools are used by ES supervisors and managers, training staff and others involved in quality improvement relating to cleaning in healthcare settings.

Time Required

Audits should be carried out over a period of time to allow sufficient observations of practice. The time this takes will depend upon the client/patient/resident population and rate of bed occupancy.

Scoring

All observed criteria should be marked either 'Yes', 'No' or 'Not Applicable'. It is not acceptable to enter a 'Not Applicable' response where an improvement may be achieved. If an environmental marking tool is used to assess cleanliness, presence of residual material indicates that cleaning was ineffective and a 'No' should be scored.

YES = cleaning was effective

NO = cleaning was ineffective

N/A = not applicable (i.e., the item is not present)

On completion of the audit, add the total number of 'Yes' responses and divide by the total number of questions answered (all 'Yes' and 'No' answers, excluding the 'Not Applicable' responses), then multiply by 100 to get the percentage compliance.

If more than one functional area has been audited, the total scores can be added together and divided by the number of areas included to identify the overall average compliance rate.

- Prepared, validated audit tools for cleaning patient/resident rooms and equipment are available for CHICA- Canada members from the CHICA-Canada website: http://www.chica.org/index.php

The following is a sample observational audit tool for daily cleaning for a patient room.

ENVIRONMENTAL SERVICES OBSERVATIONAL AUDIT

June 2012

Site: _____ Unit: _____ Room: _____

Observation done by: _____ Date: _____

Time observation starts: _____ Time Finished: _____

Room type	Clean type	Precaution Clean Type
❑ Patient Room	❑ Daily ❑ Discharge	❑ Routine ❑ Contact ❑ Additional precautions ❑ Droplet ❑ Airborne with Sporicidal ❑ Enhanced

Instructions

The following should be used to standardize the manner in which the environmental cleaning process and product effectiveness can be most consistently evaluated.

- Perform observations in an open manner (this is not a performance evaluation).
- Explanation to patient includes that the observation is being done in collaboration with Environmental Services (ES) to check on process and product effectiveness.
- Provide feedback to the ES staff after the clean is complete. (Do not interrupt cleaning process).
- After completion of audit, address deficiencies with ES staff so that corrections can be made on the spot.
- Contact supervisor with results.

Environmental Service cart set up

	Yes	No	N/A
ES cart: The ES cart is set up appropriately (clean items on top, dirty items on the bottom).			

Comments

Infection Control

	Yes	No	N/A
Precautions: Employee checks precautions and wears appropriate PPE.			
Hand hygiene: Hand hygiene procedures are followed appropriately.			
Hand hygiene is performed as soon as gloves are removed			
Glove/Bare hands: The employee uses gloves and bare hands appropriately			
Cloths: Cloths are wet enough to achieve dwell times			
Cloths are changed appropriately (one side of cloth per surface)			
Clean to dirty flow: i.e. patient room is cleaned first followed by the bathroom			

Isolation room cleaning: Staging Area

	Yes	No	N/A
Sets up staging area appropriately. Brings all necessary equipment and supplies into the room. Does not exit room while cleaning.			
Dismantles staging area appropriately, including disinfecting tools used and removing mop heads.			

Were the following items cleaned or disinfected appropriately?

1. *Was the targeted area cleaned/disinfected?*
2. *Were the appropriate tools and techniques used?*
3. *Was the appropriate dwell time achieved? (Q.1-3 must all be "yes" to check yes)*

	Yes	No	N/A		Yes	No	N/A
Bed adjustment controls	_____	_____	_____	Bathroom faucets handles	_____	_____	_____
Bedside table handle	_____	_____	_____	Bathroom inner door knob	_____	_____	_____
Overbed table	_____	_____	_____	Bathroom light switch	_____	_____	_____
Bedside light switch	_____	_____	_____	Toilet handrails	_____	_____	_____
Chair	_____	_____	_____	Toilet seat	_____	_____	_____
	_____	_____	_____	Toilet flush handle	_____	_____	_____

Was the room cleaned in the appropriate sequence?

	Yes	No	N/A
✓ **Patient room: Daily Clean (approx. 10 min)** ❑ 1. **Enter:** Check precautions, wash hands, put on appropriate PPE, AIDET ❑ 2. **Disinfect and inspect:** Bed side area ⇨Other areas in patient room ⇨Washroom ❑ 3. **Garbage:** Collect and dispose of waste. Change sharps container if three-quarters full. Hand hygiene after waste disposal. ❑ 4. **Floors:** Dust mop entire floor (However, must not dust mop in isolation rooms or washrooms). Damp mop in traffic areas in patient room and entire washroom floor ❑ 5. **Restock**: Restock using bare hands	_____	_____	_____
✓ **Patient room: Discharge Clean (approx. 30 min)** ❑ 1. **Enter**: Put bed into progress, check Precautions, wash hands, put on PPE, AIDET ❑ 2. **Strip the room:** Collect and remove curtains (as appropriate), dirty linen, garbage, sharps container (as appropriate), blue ware ❑ 3. **Clean the room:** High dust ⇨ Disinfect bed ⇨ Start at the door and work around the room disinfecting all furniture and fixtures, patient equipment, windows and garbage bins ⇨ Washroom ❑ 4. **Floors**: Dust mop entire floor (However, must not dust mop in isolation rooms or washrooms). Damp mop entire patient room and washroom floor ❑ 5. **Remake the room:** Wash hands and then make bed and restock using bare hands	_____	_____	_____

Did you speak with the ES staff after the audit was completed?

Comments:

16. Appendix J: Sample Environmental (UV) Marking Audit

The Environmental (UV) Marking Audit compliments visual inspections of the room, by providing the means to measure and assess the cleaning practices, specifically of high touch items within the patient's environment. Each audit focuses on a selection of 10 high touch items, and determines if the mechanical action of the cleaner was sufficient to remove soil.

Tools Required:

- UV Marker (powder, lotion, or pen)
- Application template (template the size of a dime used to apply UV marker)
- Ultraviolet light flashlight
- Audit form (paper or electronic)

Process:

The following steps should be used to standardize the manner in which the thoroughness of cleaning can be most consistently assessed.

- Audits are random and unannounced.
- Random sampling of room types is performed where possible to include single occupied, multi-bed room, precaution (isolation) room, and rooms where patients are to be discharged that day
- The number of audits done for a facility is determined by the number of beds in the facility:
    - ❑ more than 100 beds — 15% of the beds
    - ❑ 25-100 beds — 10-25% of the beds
    - ❑ less than 25 beds — 100% of the beds
- Determine which 10 surfaces in the room will be marked and identify them on the audit form, a minimum of 8 areas should be marked.
- Using the application template, place a dime-sized amount of UV marker on each surface selected.
- Evaluate the room 24 hours after the placement of the UV marker, using the ultraviolet light to determine the degree to which the marker has been removed.
- The auditor will indicate on the audit form which items had the UV marker totally removed and which had marker remaining.
- The auditor will use a disinfectant wipe on any failed surface to determine if the UV marker will wipe off. If partial removal is a result of the type of surface (i.e., rough, not easily wipe-able) this should be documented in the Comments section.
- Result feedback is given to the unit housekeeper or ES supervisor after the evaluation.

Scoring:

- Clean (1) = No UV marker is visible
- Not Clean (0) = All or some of the UV marker is visible
- Percentage score is determined by dividing the number of 'Clean' items by the number of items marked and multiplying by 100
- Audits scored below 85% will be considered to have not met cleaning standards for UV audits.

[**NOTE**: The process and form is adapted from those developed by Vancouver Coast Health Authority and Vancouver Island Health Authority.]

Environmental Cleaning - UV Marker (UVM) Audit Tool

Purpose: To ensure high-touch environmental surfaces are appropriately cleaned.

Date marked:	**Time marked:**	**Unit:**	**Room #:**
Auditor:	**Room type** (circle one): Single Multi-bed Precaution Discharge		
Date evaluated:	**Time evaluated:**		

High-Touch Surface (select 10)	**Surface Marked**	**Clean**	**Not Clean**	**Comments**
1. Bed control				
2. Bed rails				
3. Bedside table				
4. Over bed table (consider the underside)				
5. Bedside or room light switch				
6. Call bell				
7. Blood pressure cuff (affixed to wall)				
8. Bedside telephone				
9. Room sink faucet handle				
10. Bathroom faucet handle				
11. Bathroom inner door knob				
12. Bathroom light switch				
13. Toilet handrails				
14.Toilet seat				
15.Toilet flush handle				
	(# Clean/10 Areas Marked) x 100% = Audit %			**Audit %: _____**

Overall Comments: _____

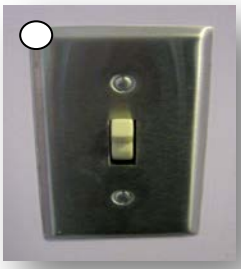
Housekeeper/ES supervisor notified of results □Yes □ No

Issue resolved (if required) – Date/Time: _____ Signature:

1. Bed adjustment controls – **External** side beside buttons

2. Bedside table handle – On handle or if no handle, place on drawer face

3. Over bed table – UVM on one of four corners



4. and 8. Bedside/bathroom light switch UVM on one of four corners of plate

5. and 6. Sink faucet handles – On the side of a handle

7. Bathroom inner doorknob – End of lever handle

9. Handrails by toilet – At curve where rail goes towards the wall

10. Toilet seat – On front aspect of porcelain surface

11. Toilet flusher – Top of handle 2/3 away from edge

17. Appendix K: Advantages and Disadvantages of New Technologies (2013)

M-1: Advantages and Disadvantages of Microfibre Mops and Cloths

Advantages:

- microfibre mops and cloths show superior microbial removal compared to regular mops and cloths
- less risk of cross-contamination from room to room
- increased absorbency
- reduced chemical use and disposal
- reduced water requirements
- reduced laundry requirements
- cost-effective (washing lifetime 300-1000x)
- ergonomic (lightweight), resulting in reduced worker injuries, lost work time and compensation claims
- drier floors
- reduced cleaning times

Disadvantages:

- microfibre mops and cloths require special laundering
- microfibres are damaged by high pH (e.g., bleach), fabric softeners, oils and complex surfactants
- initial cost associated with replacing old system for new system, but this may be offset with decreased use of cleaning and disinfecting agents
- should not be used in greasy, high-traffic areas such as kitchens

M-2: Advantages and Disadvantages of Hydrogen Peroxide (HP) Air Disinfection Systems

Advantages:

- more effective decontamination compared to routine cleaning
- effective against *C. difficile* spores
- by-products are safe for the environment
- useful for decontaminating soft furnishings and complex equipment that is difficult to clean
- uniform distribution in the room via an automated dispersal system
- does not require that furniture and equipment be moved away from the walls
- may be used to decontaminate entire units/wards during outbreaks

Disadvantages:

- time-consuming (average three to five hours to complete for HP)
- all patients and staff shall be removed from the room before decontamination (discharge/transfer cleaning)
- biological soiling reduces the efficacy of HP
- air ducts from the room and gaps under doors shall be sealed prior to decontamination
- optimal methodology (including exposure time) is still under investigation
- pre-cleaning is required to remove dust and stains
- the nature of the environmental surface may affect efficacy of HP
- expensive

M-3: Advantages and Disadvantages of Ozone Gas

Advantages:

- effectively penetrates all areas of a room, even areas difficult to access or clean by conventional cleaning methods (e.g., fabrics, under beds, inside cracks)
- administration of gas can be controlled from outside the room
- easy and economical to produce
- by-products are safe for the environment
- decontaminates surfaces even if biological material has been dried onto them
- decontaminates a large area relatively quickly (less than one hour for an entire room)

Disadvantages:

- toxic at high concentrations
- all patients and staff shall be removed from the room before decontamination (discharge/transfer cleaning)
- air ducts from the room and gaps under doors shall be sealed prior to decontamination
- area to be decontaminated shall remain sealed off from other areas until ozone levels return to safe limits
- considered a toxic process gas under the BC Occupational Health and Safety Regulation. There are strict rules regarding its generation and use in a workplace

M-4: Advantages and Disadvantages of Ultraviolet Irradiation (UVI) of Surfaces

Advantages:

- good efficacy against a wide range of healthcare-associated pathogens
- automated method – no manual labour is required
- relatively short exposure time required (15 minutes to 50 minutes)
- no residue left following disinfection
- room does not need to be sealed prior to use
- low operating costs

Disadvantages:

- destructive effect over time on plastics and vinyls and fading of paints and fabrics
- low penetrating effect
- less effective in the presence of organic materials
- long exposure times may be required for some organisms (e.g., most fungi and some bacterial spores)
- disinfection does not occur in shadowed areas where the ultraviolet light cannot penetrate;
- equipment and furniture should be moved out from the walls
- expensive for initial outlay of equipment
- rooms shall be vacant of patients and staff during UVI disinfection and a warning sign shall be posted
- staff should avoid entry during UVI disinfection

M-5: Advantages and Disadvantages of Steam Vapour Disinfection

Advantages:

- rapid (five to 10 seconds of exposure)
- inexpensive
- extracts grease, oil, stains and dirt as well as effectively killing microorganisms
- no residue left following disinfection
- no need to remove patients/residents from the room during cleaning
- can be used on electronic equipment and most fabrics
- steam generators are portable

Disadvantages:

- may distort or melt some types of plastics and vinyls

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