Provincial Infectious
Diseases Advisory
Committee
(PIDAC)

Best Practices for Environmental Cleaning for Prevention and Control of Infections

In All Health Care Settings

THIS DOCUMENT IS INTENDED TO PROVIDE BEST PRACTICES ONLY.

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

December 8, 2009

Ontario

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This document was developed by the Provincial Infectious Diseases Advisory Committee (PIDAC). PIDAC is a multidisciplinary scientific advisory body that provides to the Chief Medical Officer of Health evidence-based advice regarding multiple aspects of infectious disease identification, prevention and control. PIDAC's work is guided by the best available evidence and updated as required. Best Practice documents and tools produced by PIDAC reflect consensus positions on what the committee deems prudent practice and are made available as a resource to the public health and health care providers.

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Abbreviations

ABHR	Alcohol-Based Hand Rub
CAEM	Canadian Association of Environmental Management
CDC	Centers for Disease Control and Prevention (U.S.)
CHICA	Community and Hospital Infection Control Association - Canada
CSA	Canadian Standards Association
DIN	Drug Identification Number
ECG	Electrocardiogram
ES	Environmental Services/Housekeeping
HAI	Health Care-Associated Infection
HICPAC	Healthcare Infection Control Practices Advisory Committee (U.S.)
ICP	Infection Prevention and Control Professional
LLD	Low-Level Disinfection
LTC	Long-Term Care
MOHLTC	Ministry of Health and Long-Term Care (Ontario)
MRSA	Methicillin-Resistant *Staphylococcus aureus*
MSDS	Material Safety Data Sheet
NICU	Neonatal Intensive Care Unit
OHHA	Ontario Health-Care Housekeepers' Association
OHS	Occupational Health and Safety
ORNAC	Operating Room Nurses Association of Canada
PHAC	Public Health Agency of Canada
PIDAC	Provincial Infectious Diseases Advisory Committee
PPE	Personal Protective Equipment
PPM	Parts Per Million
QUAT	Quaternary Ammonium Compound
RICN	Regional Infection Control Networks
RSV	Respiratory Syncytial Virus
UVI	Ultraviolet Irradiation
VHP	Vapourized Hydrogen Peroxide
VOC	Volatile Organic Compounds
VRE	Vancomycin-Resistant Enterococci
WHMIS	Workplace Hazardous Materials Information System

Glossary of Terms

Additional Precautions (AP): Precautions (i.e., Contact Precautions, Droplet Precautions, Airborne Precautions) that are necessary in addition to Routine Practices for certain pathogens or clinical presentations. These precautions are based on the method of transmission (e.g., contact, droplet, airborne).

Alcohol-based Hand Rub (ABHR): A liquid, gel or foam formulation of alcohol (e.g., ethanol, isopropanol) which is used to reduce the number of microorganisms on hands in clinical situations when the hands are not visibly soiled. ABHRs contain emollients to reduce skin irritation and are less time-consuming to use than washing with soap and water.

Antibiotic-Resistant Organism (ARO): A microorganism that has developed resistance to the action of several antimicrobial agents and that is of special clinical or epidemiological significance.

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.[1]

Biomedical Waste: Contaminated, infectious waste from a health care 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.[2, 3]

Canadian Association of Environmental Management (CAEM): A national, non-profit organization representing environmental management professionals within the health care sector and other industry professionals responsible for environmental cleaning. The CAEM website is located at: http://www.caha1972.ca.

CHICA-Canada: The Community and Hospital Infection Control Association (CHICA) of Canada, a professional organization of persons engaged in infection prevention and control activities in health care settings. CHICA-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 CHICA-Canada website is located at: http://www.chica.org.

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

Client/Patient/Resident: Any person receiving care within a health care setting.

Cohorting: The sharing of a room or ward by two or more clients/patients/residents who are either colonized or infected with the same microorganism; or the sharing of a room or ward by colonized or infected clients/patients/residents who have been assessed and found to be at low risk of dissemination, with roommates who are considered to be at low risk for acquisition.

Complex Continuing Care (CCC): Complex continuing care provides continuing, medically complex and specialized services to both young and old, sometimes over extended periods of time. Such care also includes support to families who have palliative or respite care needs.

Construction Clean: Cleaning performed at the end of a workday by construction workers that removes gross soil and dirt, construction materials and workplace hazards. Cleaning may include sweeping and vacuuming, but usually does not address horizontal surfaces or areas adjacent to the job site.

Contact Precautions: Precautions that are used in addition to Routine Practices to reduce the risk of transmitting infectious agents via contact with an infectious person.

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

Continuum of Care: Across all health care sectors, including settings where emergency (including pre-hospital) care is provided, hospitals, complex continuing care, rehabilitation hospitals, long-term care homes, outpatient clinics, community health centres and clinics, physician offices, dental offices, offices of other health professionals, Public Health and home health care.

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.[2]

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.

Discharge Cleaning: See *Terminal Cleaning*

Disinfectant: A product that is used on surfaces or medical equipment/devices which results in disinfection of the equipment/device. 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. Medical equipment/devices must be cleaned thoroughly before effective disinfection can take place. See also, *Disinfectant*.

Double Cleaning: Repeating a cleaning regimen immediately after it has been done once. Double cleaning is not the same as cleaning twice per day. Double cleaning must be documented.

Drug Identification Number (DIN): In Canada, disinfectants are regulated as drugs under the *Food and Drugs Act* and Regulations. Disinfectant manufacturers must obtain 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.

Environment of the Client/Patient/Resident: The immediate space around a client/patient/resident that may be touched by the client/patient/resident and may also be touched by the health care provider when providing care. The client/patient/resident 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 client/patient/resident uses. In a multi-bed room, the client/patient/resident environment is the area inside the individual's curtain. In an ambulatory setting, the client/patient/resident environment is the area that may come into contact with the client/patient/resident 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, *Health Care Environment*.

Enzymatic Cleaner: A pre-cleaning agent which contains protease enzymes that break down proteins such as blood, body fluids, secretions and excretions from surfaces and equipment. Most enzymatic cleaners also contain a detergent. Enzymatic cleaners are used to loosen and dissolve organic substances prior to cleaning.

Fomites: Objects in the inanimate environment that may become contaminated with microorganisms and serve as vehicles of transmission.[3]

Hand Hygiene: A general term referring to any action of hand cleaning. Hand hygiene relates to the removal of visible soil and 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 hygiene includes surgical hand antisepsis.

Hand Washing: The physical removal of microorganisms from the hands using soap (plain or antimicrobial) and running water.

Hawthorne Effect: A short-term improvement caused by observing staff performance.

Health Care-Associated Infection (HAI): A term relating to an infection that is acquired during the delivery of health care (also known as *nosocomial infection*).

Health Care Environment: People and items which make up the care environment (e.g., objects, medical equipment, staff, clients/patients/residents) of a hospital, clinic or ambulatory setting, outside the immediate environment of the client/patient/resident. See also, *Environment of the Client/Patient/Resident*.

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

Health Care Provider: Any person delivering care to a client/patient/resident. 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 and home health care workers. In some non-acute settings, volunteers might provide care and would be included as a health care provider. See also, *Staff*.

Health Care Setting: Any location where health care 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 health care.

High-Touch Surfaces: High-touch surfaces are those that have frequent contact with hands. Examples include doorknobs, call bells, bedrails, light switches, wall areas around the toilet and edges of privacy curtains.

Hoarding: A temporary fence or wall enclosing a construction site.

Hospital Clean: The measure of cleanliness routinely maintained in client/patient/resident care areas of the health care setting.[4] Hospital Clean is '*Hotel Clean*' with the addition of disinfection, increased frequency of cleaning, auditing and other infection control measures in client/patient/resident care areas.

Hospital-Grade Disinfectant: A low-level disinfectant that has a drug identification number (DIN) from Health Canada indicating its approval for use in Canadian hospitals.

Hotel Clean: A measure of cleanliness based on visual appearance that includes dust and dirt removal, waste disposal and cleaning of windows and surfaces. Hotel clean is the basic level of cleaning that takes place in all areas of a health care setting.

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: Evidence-based practices and procedures that, when applied consistently in health care settings, can prevent or reduce the risk of infection in clients/patients/residents, health care providers and visitors.

Infection Prevention and Control Professional(s) (ICPs): Trained individual(s) responsible for a health care setting's infection prevention and control activities. In Ontario an ICP must receive a minimum of 80 hours of instruction in a CHICA-Canada endorsed infection control program within six months of entering the role and must acquire and maintain Certification in Infection Control (CIC) when eligible.

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

Long-Term Care (LTC): A broad range of personal care, support and health services provided to people who have limitations that prevent them from full participation in the activities of daily living. The people who use long-term care services are usually the elderly, people with disabilities and people who have a chronic or prolonged illness.

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. Equipment and surfaces must be thoroughly cleaned prior to low-level disinfection.

Low-Touch Surfaces: Surfaces that have minimal contact with hands. Examples include walls, ceilings, mirrors and window sills.

Manufacturer: Any person, partnership or incorporated association that manufactures and sells medical equipment/devices under its own name or under a trade mark, 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, whether used alone or in combination, intended by the manufacturer to be used for human beings for the purpose of diagnosis, prevention, monitoring, treatment or alleviation of disease, injury or handicap; investigation, replacement, or modification of the anatomy or of a physiological process; or control of conception.

Methicillin-Resistant *Staphylococcus aureus* (MRSA): MRSA is a strain of *Staphylococcus aureus* that has a minimal inhibitory concentration (MIC) to oxacillin of ≥ 4 mcg/ml and contains the *mecA* gene coding for penicillin-binding protein 2a (PBP 2a). MRSA is resistant to all of the beta-lactam classes of antibiotics, such as penicillins, penicillinase-resistant penicillins (e.g. cloxacillin) and cephalosporins. MRSA has been associated with health care-associated infections and outbreaks.

Monitoring: A planned series of observations or measurements of a named parameter[5] (e.g., monitoring cleaning of client/patient/resident rooms).

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

Occupational Health and Safety (OHS): Preventive and therapeutic health services in the workplace provided by trained occupational health professionals, e.g., nurses, hygienists, physicians.

Ontario Health-Care Housekeepers' Association (OHHA): An organization representing professional health care housekeepers and providing management and leadership education, training and representation in the Ontario Hospital Association. More information is available at: http://www.ontariohealthcarehousekeepers.com/.

Personal Protective Equipment (PPE): Clothing or equipment worn by staff for protection against hazards.

Precautions: Interventions 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: Acute emergency client/patient/resident assessment and care delivered in an uncontrolled environment by designated practitioners, performing delegated medical acts at the entry to the health care continuum.

Provincial Infectious Diseases Advisory Committee (PIDAC): A multidisciplinary scientific advisory body which provides to the Chief Medical Officer of Health evidence-based advice regarding multiple aspects of infectious disease identification, prevention and control. More information is available at: http://www.pidac.ca.

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.

Regional Infection Control Networks (RICN): The RICN of Ontario coordinate and integrate resources related to the prevention, surveillance and control of infectious diseases across all health care sectors and for all health care providers, promoting a common approach to infection prevention and control and utilization of best-practices within the region. More information is available at: http://www.ricn.on.ca.

Reprocessing: The steps performed to prepare used medical equipment for use (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.

Routine Practices: The system of infection prevention and control practices recommended by the Public Health Agency of Canada to be used with all clients/patients/residents during all care to prevent and control transmission of microorganisms in all health care settings. For a full description of Routine Practices, refer to the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions for all Health Care Settings'*.[6] The Ministry's Routine Practices fact sheet is available at: http://www.health.gov.on.ca/english/providers/program/infectious/pidac/fact_sheet/fs_routine_010107.pdf.

Safety Engineered Medical Device: A non-needle sharp or a needle device used for withdrawing body fluids, accessing a vein or artery, or administering medications or other fluids, with a built-in safety feature or mechanism that effectively reduces exposure incident risk. Safety engineered devices shall be licensed by Health Canada.

Sharps: Objects capable of causing punctures or cuts (e.g., needles, lancets, sutures, blades, clinical glass).

Staff: Anyone conducting activities in settings where health care is provided, including health care providers. See also, *Health Care Providers*.

Surge Capacity: The ability to provide adequate services during events that exceed the limits of the normal infrastructure of a health care setting. This includes providing additional environmental cleaning (materials, human resources) when required during an outbreak.

Terminal Cleaning: The thorough cleaning of a client/patient/resident room or bed space following discharge, death or transfer of the client/patient/resident, in order to remove contaminating microorganisms that might be acquired by subsequent occupants and/or staff. In some instances, terminal cleaning might be used when some types of Additional Precautions have been discontinued.

Vancomycin-Resistant Enterococci (VRE): VRE are strains of *Enterococcus faecium* or *Enterococcus faecalis* that have a minimal inhibitory concentration (MIC) to vancomycin of ≥ 32 mcg/ml. and/or contain the resistance genes *vanA* or *vanB*.

Workplace Hazardous Materials Information System (WHMIS)[7]: 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 (MSDSs) and staff education and training programs.

Preamble

Health care-associated infections (HAIs) are infections that occur as a result of health care interventions in any health care setting where care is delivered. Factors that increase the risk to clients/patients/residents for the development of HAIs include:

- advanced age
- greater acuity
- increasing numbers of immunocompromised clients/patients/residents
- complex treatments
- increasing antimicrobial use in hospitals and institutional health care settings, creating a large reservoir of resistant microbial strains[8]
- infrastructure repairs and renovations to aging hospitals and long-term care homes creating the risk of airborne fungal diseases caused by dust and spores released during demolition and construction.[9, 10]

In addition, overcrowding, understaffing and pressures to move more patients through the health care system can challenge completion of environmental cleaning.

The environment around the client/patient/resident influences the incidence of infection in hospitals and other health care settings.[11] Reducing the numbers of microorganisms from the health care environment is accomplished by cleaning and disinfection. There are no national standards for cleaning in health care settings in Canada, although these standards exist in other countries such as the U.K.[12] and Australia.[13, 14] The best practices set out in this document will provide criteria for cleanliness in health care settings that may be adopted by Environmental Services (ES) managers for their use or for the use of contracted services.

Health care-associated infections remain a patient safety issue and represent a significant adverse outcome of the provision of care.[15, 16] With the changing trends in health care that have resulted in the provision of complex treatments outside of the acute care setting (e.g., ambulatory care, physician office), HAIs have become a concern in health care settings across the continuum of care.

About This Document

This document deals with cleaning of the physical environment in health care as it relates to the prevention and control of infections.

This document also deals with cleaning medical equipment that only comes into contact with intact skin (i.e., non-critical equipment). This document does not include disinfection and sterilization of invasive medical equipment or the use and disposal of chemicals or medications (e.g., chemotherapy). For more information about reprocessing medical equipment, see the Ministry of Health and Long-Term Care's '*Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings*',[17] available at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/ic_cds.html.

This document is targeted to those who have a role in the management of cleaning/housekeeping services for the health care setting. This includes administrators, supervisors of ES departments, infection prevention and control professionals, supervisors of construction/maintenance projects and public health investigators.

This document provides infection prevention and control practices for:

a) understanding the principles of cleaning and disinfecting environmental surfaces;
b) infection transmission risk assessment to guide level of cleaning;
c) cleaning practices for different types of care areas, including specialized cleaning for antibiotic-resistant microorganisms;
d) frequency of cleaning;
e) cleaning strategies for spills of blood and body substances;

f) cleaning practices for non-critical equipment and furnishings;
g) handling of laundry and bedding;
h) management of contaminated waste; and
i) cleaning practices during and following completion of construction projects.

For Recommendations in this Document:

- **'*shall*' indicates mandatory requirements based on legislated requirements**
- **'*must*' indicates best practice, i.e., the minimum standard based on current recommendations in the medical literature**
- **'*should*' indicates a recommendation or that which is advised but not mandatory**
- **'*may*' indicates an advisory or optional statement**

Evidence for Recommendations

The best practices in this document reflect the best evidence and expert opinion available at the time of writing. As new information becomes available, this document will be reviewed and updated. Refer to Appendix A, '*Ranking System for Recommendations*', for the grading system used for recommendations.

How and When to Use This Document

The cleaning practices set out in this document must be practiced in all settings where care is provided, across the continuum of health care, with the exception of cleaning of the client's home in home health care. This includes settings where emergency (including pre-hospital) care is provided, hospitals, complex continuing care facilities, rehabilitation facilities, long-term care homes, mental health facilities, outpatient clinics, community health centres and clinics, physician offices, dental offices and offices of other health professionals.

Assumptions and General Principles for Infection Prevention and Control

The best practices in this document are based on the assumption that health care settings in Ontario already have basic infection prevention and control systems and practices such as those described in the following document:

- Ministry of Health and Long-Term Care's '*Recommendations for Infection Prevention and Control Programs in Ontario in All Health Care Settings*',[18] available at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/best_prac/bp_ipcp_20080905.pdf).

These settings should work with organizations that have infection prevention and control expertise, such as academic health science centres, regional infection control networks, public health units that have professional staff certified in infection prevention and control and local infection prevention and control associations (e.g., Community and Hospital Infection Control Association – Canada chapters), to develop evidence-based programs.

In addition to the general assumption (*above*) about basic infection prevention and control, these best practices are based on the following additional assumptions and principles:

1. Best practices to prevent and control the spread of infectious diseases are routinely implemented in health care settings, including:
    a) Health Canada's '*Routine Practices and Additional Precautions for Preventing the Transmission of Infection in Health Care*' (Can Commun Dis Rep. 1999; 25 Suppl 4:1-142) [under revision]),[19] available at: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/99vol25/25s4/index.html.
    b) Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions in All Health Care Settings*',[6] available at: http://www.pidac.ca.

2. Adequate resources are devoted to infection prevention and control in all health care settings. See the Ministry of Health and Long-Term Care's '*Best Practices for Infection Prevention and Control Programs in Ontario*',[18] available at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/best_prac/bp_ipcp_20080905.pdf.

3. Programs are in place in all health care settings that promote good hand hygiene practices and ensure adherence to standards for hand hygiene. See:
    a) Ministry of Health and Long-Term Care's '*Best Practices for Hand Hygiene in All Health Care Settings*',[20] available at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/ic_hh.html.
    b) Ontario's hand hygiene improvement program, '*Just Clean Your Hands*',[21] available at: http://www.justcleanyourhands.ca.

4. Programs are in place in all health care settings that ensure effective disinfection and sterilization of used medical equipment according to the Ministry of Health and Long-Term Care's '*Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings*',[17] available online at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/ic_cds.html.

5. Regular education (including orientation and continuing education) and support to help staff consistently implement appropriate infection prevention and control practices is provided in all health care settings.

6. Effective education programs emphasize:
    a) the risks associated with infectious diseases, including acute respiratory illness and gastroenteritis;
    b) hand hygiene, including the use of alcohol-based hand rubs and hand washing;
    c) principles and components of Routine Practices as well as additional transmission-based precautions;
    d) assessment of the risk of infection transmission and the appropriate use of personal protective equipment (PPE), including safe application, removal and disposal;
    e) individual staff responsibility for keeping clients/patients/residents, themselves and co-workers safe; and
    f) collaboration between professionals involved in Infection Prevention and Control and Occupational Health and Safety (OHS).

    NOTE: *Education programs should be flexible enough to meet the diverse needs of the range of health care providers and other staff who work in the health care setting. The local public health unit and regional infection control networks may be a resource and can provide assistance in developing and providing education programs for community settings.*

7. Collaboration between professionals involved in Occupational Health and Infection Prevention and Control is promoted in all health care settings to implement and maintain appropriate infection prevention and control standards that protect staff.

8. There are effective working relationships between the health care setting and local Public Health. Clear lines of communication are maintained and Public Health is contacted for information and advice as required and the obligations (under the *Health Protection and Promotion Act*, R.S.O. 1990, c.H.7)[22] to report reportable and communicable diseases is fulfilled. Public Health provides regular aggregate reports of outbreaks of any infectious diseases in facilities and/or in the community to all health care settings.

9. Access to ongoing infection prevention and control advice and guidance to support staff and resolve differences is available to the health care setting.

10. There are established procedures for receiving and responding appropriately to all international, national, regional and local health advisories in all health care settings. Health advisories are communicated promptly to all staff responsible for case finding/surveillance and regular updates are provided. Current advisories are available from Public Health, the Ministry of Health and Long-Term Care (MOHLTC), Health Canada and the Public Health Agency of Canada websites as well as local regional infection prevention and control networks.

11. Where applicable, there is a process for evaluating personal protective equipment (PPE) in the health care setting, to ensure it meets quality standards.

12. There is regular assessment of the effectiveness of the infection prevention and control program and its impact on practices in the health care setting. The information is used to further refine the program.[18, 22]

13. The Ministry of Health and Long-Term Care's Long-Term Care Home Compliance and Enforcement Program requirements shall be met. Specific legislative requirements for long-term care providers may be found in:

    - The *Nursing Homes Act*, available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90n07_e.htm
        - The *Nursing Homes Act*, R.R.O. 1990, Regulation 832, available online at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900832_e.htm
    - The *Homes for the Aged and Rest Homes Act*, available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h13_e.htm
        - The *Homes for the Aged and Rest Homes Act*, R.R.O. 1990, Regulation 637, available online at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900637_e.htm
    - The *Charitable Institutions Act*, available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90c09_e.htm
        - The *Charitable Institutions Act*, R.R.O. 1990, Regulation 69, available online at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900069_e.htm

    In addition, all long-term care providers shall comply with all requirements outlined in the MOHLTC's '*Long-Term Care Homes Program Manual*',[23] which is the core text governing the operation of long-term care homes in the province of Ontario. This manual contains policies, standards and norms covering various aspects of the LTC Homes Program such as:

    a) Risk Management, including:
        - infection control
        - health and safety
        - internal and external disaster planning
        - monitoring, evaluating and improving quality
    b) Environmental Services, including:
        - waste management
        - pest control
        - housekeeping services
        - laundry services

- maintenance services

c) Education, including:
- orientation
- ongoing in-service education
- mandatory education programs

➢ The Long-Term Care Program Manual may be accessed at: http://www.health.gov.on.ca/english/providers/pub/manuals/ltc_homes/ltc_homes_mn.html#full.

➢ For more information, please contact your local Ministry of Health Service Area Office. A list of these offices may be found at: http://www.infogo.gov.on.ca/infogo/office.do?actionType=telephonedirectory&infoType=telephone&unitId=UNT0028407&locale=en.

14. Occupational Health and Safety requirements shall be met:
Health care facilities are required to comply with applicable provisions of the *Occupational Health and Safety Act* (OHSA), R.S.O. 1990, c.0.1 and its Regulations.[24] Employers, supervisors and workers have rights, duties and obligations under the OHSA. For specific requirements under the OHSA go to:
http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm.

The *Occupational Health and Safety Act* places duties on many different categories of individuals associated with workplaces, such as employers, constructors, supervisors, owners, suppliers, licensees, officers of a corporation and workers. A guide to the requirements of the *Occupational Health and Safety Act* may be found at:
http://www.labour.gov.on.ca/english/hs/ohsaguide/index.html.

Specific requirements for certain health care and residential facilities may be found in the *Regulation for Health Care and Residential Facilities*. Go to:
http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_930067_e.htm.

In addition, the OHSA section 25(2)(h), the 'general duty clause', requires an employer to take every precaution reasonable in the circumstances for the protection of a worker. There is a general duty for an employer to establish written measures and procedures for the health and safety of workers, in consultation with the joint health and safety committee or health and safety representative, if any. Such measures and procedures may include, but are not limited to, the following:
- safe work practices
- safe working conditions
- proper hygiene practices and the use of hygiene facilities
- the control of infections

At least once a year the measures and procedures for the health and safety of workers shall be reviewed and revised in the light of current knowledge and practice. The employer, in consultation with the joint health and safety committee or health and safety representative, if any, shall develop, establish and provide training and educational programs in health and safety measures and procedures for workers that are relevant to the workers' work.

A worker who is required by his or her employer or by the *Regulation for Health Care and Residential Facilities* to wear or use any protective clothing, equipment or device shall be instructed and trained in its care, use and limitations before wearing or using it for the first time and at regular intervals thereafter and the worker shall participate in such instruction and training. The employer is reminded of the need to be able to demonstrate training, and is therefore encouraged to document the workers trained, the dates training was conducted, and materials covered during training. Under the *Occupational Health and Safety Act*, a worker must work in

compliance with the Act and its regulations, and use or wear any equipment, protective devices or clothing required by the employer.

For more information, please contact your local Ministry of Labour office. A list of local Ministry of Labour offices in Ontario may be found at http://www.labour.gov.on.ca/.

BEST PRACTICES FOR ENVIRONMENTAL CLEANING FOR INFECTION PREVENTION AND CONTROL IN ALL HEALTH CARE SETTINGS

Terms Used in this Document (see glossary for details and examples):

Health Care Provider:	**Any person delivering care to a client/patient/resident**
Staff:	**Anyone conducting activities within a health care setting (includes health care providers)**
Health Care Setting:	**Any location where health care 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 health care**

I. Principles of Cleaning and Disinfecting Environmental Surfaces in a Health Care Environment

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

Transmission involves:

a) presence of an infectious agent (e.g. bacterium, virus, fungus) on equipment, objects and surfaces in the health care environment;
b) a means for the infectious agent to transfer from patient-to-patient, patient-to-staff, staff-to-patient or staff-to-staff; and
c) presence of susceptible clients/patients/residents, staff and visitors.

In the health care 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.

Health care facilities may be categorized into two components for the purposes of environmental cleaning:

a) '*Hotel component*' is the area of the facility that is not involved in client/patient/resident care; this includes public areas such as lobbies and waiting rooms; offices; corridors; elevators and stairwells; and service areas. Areas designated in the hotel component are cleaned with a '*Hotel Clean*' regimen.
b) '*Hospital component*' is the area of the facility that is involved in client/patient/resident care; this includes client/patient/resident units (including nursing stations); procedure rooms; bathrooms;

clinic rooms; and diagnostic and treatment areas. Areas designated in the hospital component are cleaned with a '*Hospital Clean*' regimen.

Provision of a 'Hospital Clean' care environment is important for both patient safety and staff safety.

Environmental cleaning of these two component areas must be categorized and resourced differently in terms of cleaning priority, intensity, frequency and manpower. From a patient safety and staff safety perspective, Hospital Clean is the most important cleaning and resource priorities should be centred here.

- See Section III for more information regarding cleaning regimens for specified areas.

1. Evidence for Cleaning

1.1 The Environment of the Health Care Setting

The presence of microorganisms alone on objects and items in the health care environment is not sufficient to demonstrate that they contribute to infection.

The environment of the health care setting has been shown to be a reservoir for infectious agents such as bacteria (e.g., methicillin-resistant *Staphylococcus aureus* (MRSA), vancomycin-resistant enterococci (VRE), *Clostridium difficile, Acinetobacter baumannii, Pseudomonas* spp., *Stenotrophomonas*), viruses (e.g., influenza, respiratory syncytial virus - RSV, norovirus, rotavirus, astrovirus, sapovirus, rhinovirus – '*common cold*') and fungi (e.g., *Aspergillus* spp., *Fusarium spp*., *Penicillium* spp., *Stachybotrys spp*., *Mucoraceae*). However, the presence of microorganisms alone on objects and items in the health care environment is not sufficient to demonstrate that they contribute to infection.

1.2 Assessing the Literature to Determine Causality

Evidence that environmental contamination plays a role in the aetiology of health care-associated infection is evolving. While many of the reports and studies presented in Section I - 1.3 offer compelling evidence that a clean environment will result in fewer health care-associated infections, the absence of well-designed studies on the subject makes it difficult to develop evidence-based recommendations for environmental cleaning in health care settings.

A number of established criteria may be used to evaluate the strength of evidence for an environmental source or means of transmission of infectious agents. For example, according to Hill,[25] the following criteria must be met to infer causality:

a) consistency of evidence among different studies by different investigators;
b) high strength of association;
c) correct temporal sequence;
d) specificity;
e) a dose gradient; and
f) reasoning by analogy.

In the U.S., the Centers for Disease Control and Prevention (CDC) and the Healthcare Infection Control Practices Advisory Committee (HICPAC) use eight criteria for evaluating the strength of evidence for an environmental source or means of transmission of infectious agents from their '*Guidelines for Environmental Infection Control in Health-Care Facilities*' (see Box 1).[26]

1.3 Studies that Meet Evaluation Criteria

BOX 1: Criteria for Evaluating the Strength of Evidence for Environmental Sources of Infection (listed in order of strength)

1. **The organism can survive after inoculation onto the fomite.**
2. **The organism can be cultured from in-use fomites.**
3. **The organism can proliferate in or on the fomite.**
4. **Some measure of acquisition of infection cannot be explained by other recognized modes of transmission.**
5. **Retrospective case-control studies show an association between exposure to the fomite and infection.**
6. **Prospective case-control studies may be possible when more than one similar type of fomite is in use.**
7. **Prospective studies allocating exposure to the fomite to a subset of patients show an association between exposure and infection.**
8. **Decontamination of the fomite results in the elimination of infection transmission.**

Source: Centers for Disease Control and Prevention (CDC) and the Healthcare Infection Control Practices Advisory Committee (HICPAC)

Using the criteria presented in Box 1, studies that associate the environment with the possible acquisition of health care-associated infection or colonization may be categorized:

A. Studies that show that microorganisms can survive after inoculation onto items/surfaces; and/or can be cultured from the environment in health care settings; and/or can proliferate in or on items/surfaces in the environment (Criteria 1, 2, 3):

Year	Principal Author	Highlights of Study
2006	Grabsch[27]	Demonstrated widespread VRE contamination of surfaces, objects and hands (both health care provider and client/patient/resident) following outpatient procedures and haemodialysis.
2006	Kramer[28]	Common nosocomial pathogens survive for months on dry, inanimate surfaces.
2006	Van der Mee-Marquet[29]	An epidemiological link was found between clinical outbreak strains of *Enterobacter cloacae* and strains isolated from therapeutic beds in an outbreak.
2005	Jenkins[30]	*Staphylococcus aureus* survived more than four months on various cot mattress materials.
2003	Bridges[31]	Influenza virus survived up to 48 hours on nonporous surfaces.
2000	Neely[32]	Gram-negative bacteria survived on a number of hospital fabrics and plastics up to 60 days.
2000	Wagenvoort[33]	There is evidence that epidemic or outbreak strains of some pathogens (e.g., MRSA) survive longer in the environment than non-outbreak strains.

Year	Principal Author	Highlights of Study
2000	Rogers[34]	Reported an outbreak of Rotavirus on a paediatric oncology floor possibly related to shared toys which had not been included in routine cleaning regimens.
2000	Neely[35]	Enterococci and staphylococci survived on a number of hospital fabrics and plastics up to 90 days.
1998	Jawad[36]	*Acinetobacter baumannii* survives for long periods on dry surfaces.
1996	Bonilla[37]	VRE survives up to 58 days on countertops.
1991	Hirai[38]	Gram-positive cocci and *A. baumannii* survived 25 days on dry surfaces.
1990	Duckworth[39]	There is evidence that epidemic or outbreak strains of some pathogens (e.g., MRSA) survive longer in the environment than non-outbreak strains (up to 9 weeks after drying).

B. Studies that show that there is a direct means for microorganisms from contaminated items/surfaces in the environment to be transferred to hands (Criterion 4):

Year	Principal Author	Highlights of Study
2005	Duckro[40]	Showed relative frequency of transfer of VRE from items in the environment and patient skin to clean items and health care provider hands.
2004	Bhalla[41]	The hospital environment contributes significantly to contamination of health care providers' hands, the major source of transmission of nosocomial pathogens from patient-to-patient.
2003	Bridges[31]	Evidence of transmission of influenza virus from objects to hands of heath care providers.
1997	Boyce[42]	It was shown that inanimate surfaces near affected patients commonly become contaminated with MRSA and the frequency of contamination is affected by the body site at which patients are colonized or infected; staff may contaminate their gloves (or possibly their hands) by touching such surfaces which suggested that contaminated environmental surfaces may serve as a reservoir of MRSA in hospitals.
1981	Kim[43]	A correlation was demonstrated between the degree of environmental contamination and health care provider hand contamination.

C. Studies that show that exposure to contaminated items/surfaces in the environment is associated with acquisition of colonization or infection (Criteria 5, 6, 7):

Year	Principal Author	Highlights of Study
2008	Drees[44]	Prior room contamination due to VRE was found to be highly predictive of VRE acquisition by subsequent occupants of the room.
2007	Bracco[45]	Infection control measures for preventing MRSA cross-transmission are more effective in intensive care units when single rooms are used.
2006	Hardy[11]	It was shown that several patients who acquired MRSA while in the intensive care unit acquired the MRSA from the environment.
2006	Huang[46]	An association was shown between admission to an ICU room previously occupied by an MRSA-positive patient or a VRE-positive patient and an elevated risk of acquiring MRSA or VRE, respectively.
2004	Denton[47]	Authors found a significant correlation between environmental

Year	Principal Author	Highlights of Study
		contamination with *A. baumannii* and recovery of the bacterium from patients.
2003	Martinez[48]	A link was shown between the placement of patients in a particular room and acquisition of VRE, supporting the role of environmental contamination on VRE transmission.
2001	Rampling[49]	An outbreak strain of MRSA recovered from surfaces near affected patients was indistinguishable from patient strains.
1994	Orr[50]	Sampled 'clean' therapeutic bed mattress covers on receipt from a manufacturer and found VRE contamination to be prevalent on the covers; since each of the VRE-positive patients had used a therapeutic bed, it was postulated that the VRE was introduced into the facility via the beds
1992	Livornese[51]	An outbreak of VRE ended when health care providers ceased using contaminated electronic rectal thermometers.

D. Studies that show that decontamination of items/surfaces results in elimination of infection transmission, i.e., lower rates of colonization or infection (Criterion 8):

Year	Principal Author	Highlights of Study
2008	Gallimore[52]	Reduced level of environmental contamination with gastroenteric viruses due to changes in cleaning protocols.
2007	McMullen[53]	Reduction in rates of CDAD following environmental cleaning with hypochlorite solution.
2007	Zanetti[54]	Reported that there were no further cases of infection with *Acinetobacter baumannii* in a burn unit following closure of the unit for disinfection.
2006	Van der Mee-Marquet[29]	Discarding mattresses and covers epidemiologically linked to an outbreak of *Enterobacter cloacae* stopped the outbreak.
2006	Hayden[55]	Demonstrated lower rates of VRE acquisition related to enforcement of routine environmental cleaning.
2004	Denton[47]	Failure to follow strict cleaning protocols resulted in higher levels of environmental contamination with *A. baumannii*, which were significantly correlated with an increase in patient colonization with *A. baumannii*.
2004	Wright[56]	Decreases in acquisition of MRSA and VRE were observed following aggressive control measures that included supervised cleaning of rooms.
2002	Sample[57]	Control of VRE outbreaks was attributed in part to implementation of a program of environmental decontamination
2001	Rampling[49]	Showed that a prolonged hospital outbreak with MRSA could not be controlled until the organism was eliminated from the ward environment through thorough and continuous attention to cleaning and dust removal.
2000	Makris[58]	Infection control programs that include hand hygiene and environmental cleaning and disinfecting may help reduce infections among the elderly residing in long-term care settings.
2000	Falk[59]	Control of VRE outbreaks was attributed in part to implementation of a program of environmental decontamination.
2000	Mayfield[60]	It was shown that, in areas where *Clostridium difficile* is highly endemic, the use of a hypochlorite solution as an environmental disinfectant was effective in decreasing patients' risk of developing *C.difficile* diarrhea.
2000	Fitzpatrick[61]	Measured the effect of a detailed daily cleaning regimen on an MRSA unit; environmental contamination with MRSA remained low and there was no new staff acquisition of MRSA following the implementation of this cleaning protocol.

2. The Client/Patient/Resident Environment and High-Touch Surfaces

2.1 The Client/Patient/Resident Environment

Clients/patients/residents shed microorganisms into the health care environment, particularly if they are coughing, sneezing or having diarrhea. Bacteria and viruses may survive for weeks or months on dry surfaces[28, 35, 62] in the environment of the client/patient/resident (the space around a client/patient/resident that may be touched by the client/patient/resident and may also be touched by the health care provider when providing care).

The designation of a client/patient/resident's environment varies depending upon the nature of the health care setting and the ambulation of the client/patient/resident. For example:

a) in acute care, the patient environment is the area inside the curtain, including all items and equipment used in his/her care, as well as the bathroom that the patient uses.
b) in intensive care units (ICUs), the patient environment is the room or bed space and items and equipment inside the room or bed space.
c) in the nursery/neonatal setting, the patient environment is the isolette or bassinet and equipment outside the isolette/bassinet that is used for the infant.
d) in ambulatory care, the client/patient/resident environment is the immediate vicinity of the examination or treatment table or chair and waiting areas.
e) in long-term care, the resident environment includes their individual environment (e.g., bed space, bathroom) and personal mobility devices (e.g., wheelchair, walker).
f) in mental health, the patient environment may be shared space, such as group rooms, patient dining areas, central showers and washrooms.

2.2 Microorganisms in the Client/Patient/Resident Environment

Some items in the health care environment that have been shown to harbour pathogenic microorganisms are listed in <u>Table 1</u>. Cleaning disrupts transmission of these microorganisms from the contaminated environment to clients/patients/residents and health care providers. Improving cleaning practices in hospitals and other health care settings will contribute towards controlling health care-associated infection and associated costs.

Table 1: Items Found to Harbour Microorganisms in the Health Care 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[63]	Infusion equipment[42, 68]
Bed frame[64]	Light switch[52, 65]
Bed linen[42]	Overbed table[42]
Bedpan/bedpan cleaner[65]	Patient bathroom[64]
Bed rail[42, 65-67]	Patient hoist/lift and sling[64]
Bedside table[67, 68]	Pen[79]
Blood pressure cuff[27, 42]	Phlebotomy tourniquet[80, 81]
Call bell[65, 67]	Pillow/mattress[30, 63, 82]
Chair[27, 69]	Sink[68]
Clean gloves that have touched room surfaces only[70]	Stethoscope[83-86]
Computer keyboard[32, 71-75]	Suctioning and resuscitation equipment[68]
Couch[27]	Table, staff work table[87]/charting area
Door handle[27, 42, 52, 65, 76, 77]	Telephone, mobile phones[65, 67, 88]
Electronic thermometer[51, 78]	Television[52]
Faucet handle[27]	Therapeutic and fluidized bed[29, 50, 89]
Floor around bed[64]	Toilet/commode[52, 65, 67]
Haemodialysis machine[27]	Tourniquet[90]
Hydrotherapy equipment[54]	Ventilator[68]

2.3 High-touch Surfaces in Health Care Settings

Figure 1 illustrates examples of items and sites that are high-touch and which may exhibit environmental contamination in health care settings.

- See Section II - 2.2.A for more information about *high-touch surfaces*.

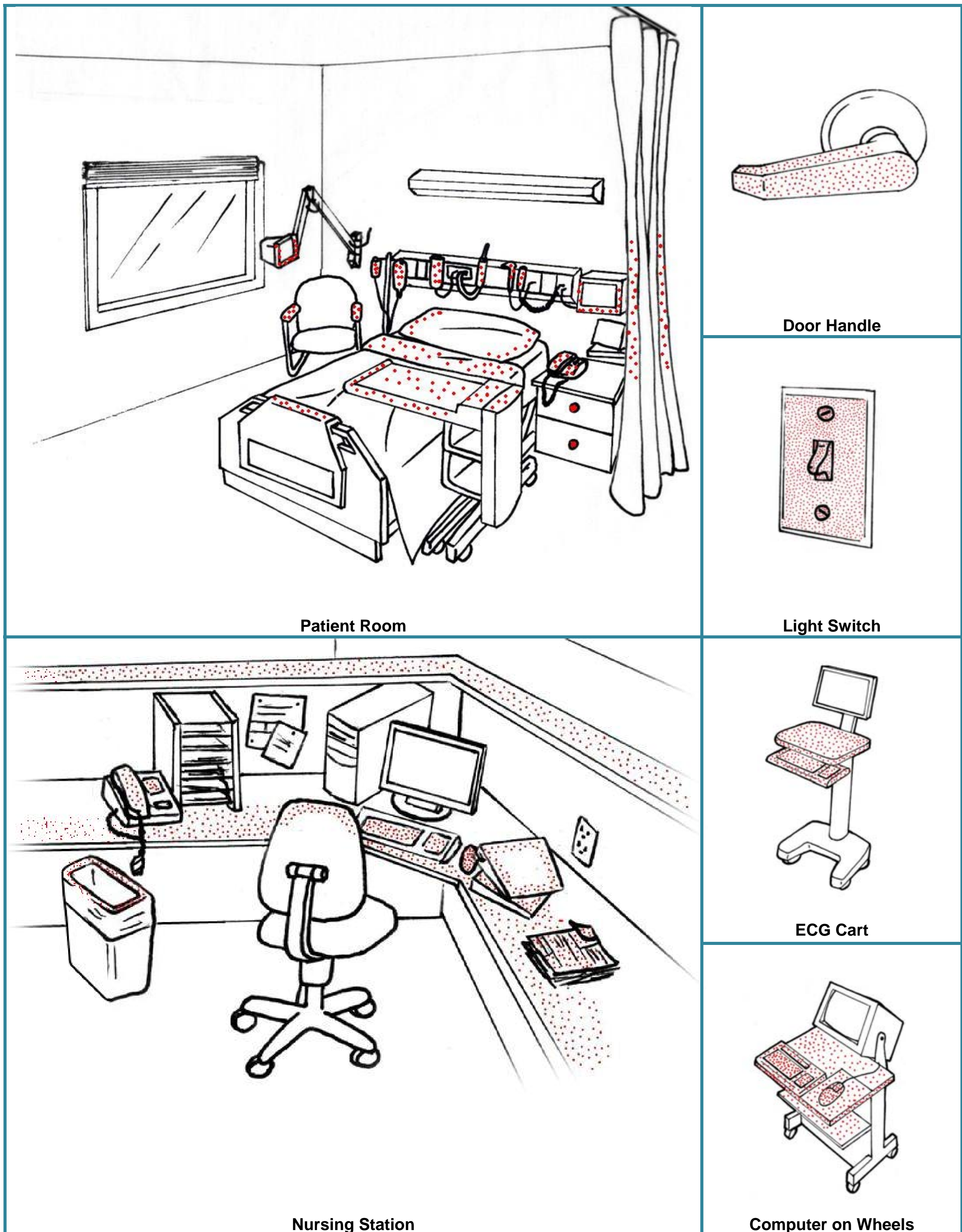


Figure 1a: Examples of High-touch Items and Surfaces in the Health Care Environment
(NOTE: Dots indicate areas of highest contamination and touch)

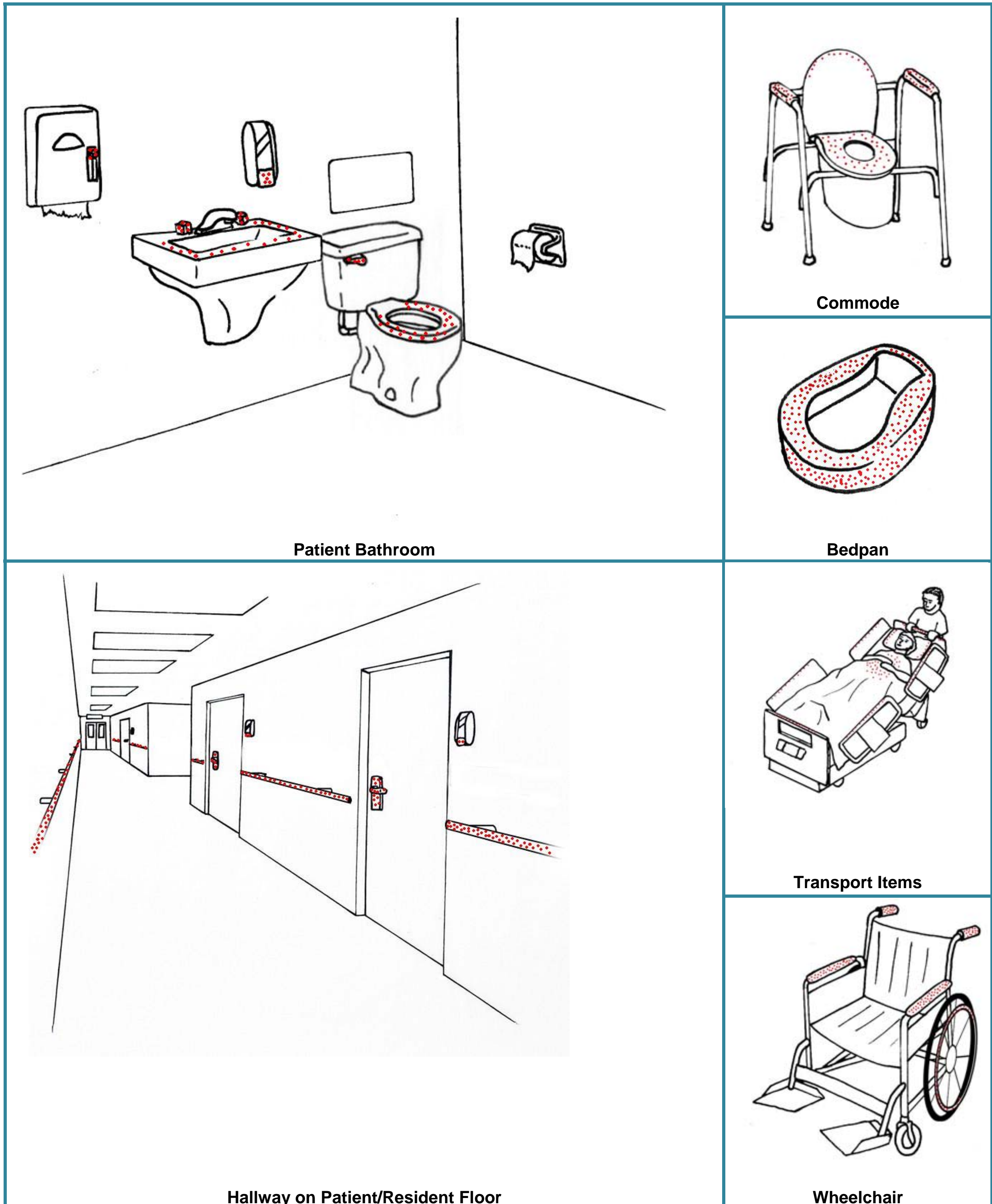


Figure 1b: Examples of High-touch Items and Surfaces in the Health Care Environment
(NOTE: Dots indicate areas of highest contamination and touch)

3. Selection of Finishes and Surfaces in the Health Care Setting in Areas Where Care is Delivered

Health care settings should have policies that include the criteria to be used when choosing furnishings and equipment for client/patient/resident care areas. A process must be in place regarding cleaning of the health care environment that includes:

a) choosing finishes, furnishings and equipment that are cleanable;
b) ensuring compatibility of the health care setting's cleaning and disinfecting agents with the items and surfaces to be cleaned; and
c) identifying when items can no longer be cleaned due to damage.

The ease of cleaning is an important consideration in the choice of materials for health care settings. This applies to materials for floors, ceilings, walls, equipment and furnishings.[91] Materials and finishes must also be able to be subjected to hospital-grade detergents, cleaners and disinfectants. It is important to involve Infection Prevention and Control, Occupational Health and Safety and Environmental Services in decisions regarding choices of furniture and finishings.

3.1 Surfaces in Health Care Settings

Important characteristics of surfaces in the health care setting for infection prevention and control purposes include[92]:

a) ease of maintenance and repair:
   i. fabrics that are torn allow for entry of microorganisms and cannot be properly cleaned;
   ii. items that are scratched or chipped allow for accumulation of microorganisms and make it more difficult to clean and disinfect the item;
b) cleanability:
   i. furnishings, walls and equipment must be able to withstand cleaning and be compatible with hospital-grade detergents, cleaners and disinfectants[93, 94];
   ii. upholstered furniture in care areas must be covered with fabrics that are fluid-resistant, non-porous and can withstand cleaning with hospital-grade disinfectants;
c) inability to support microbial growth:
   i. materials that hold moisture are more likely to support microbial growth[63];
   ii. materials such as metals and hard plastics are less likely to support microbial growth;
   iii. wet organic substrates (e.g., wood) should be avoided in hospital areas with immunocompromised patients[95];
d) surface porosity:
   i. microorganisms have been shown to survive on porous fabrics such as cotton, cotton terry, nylon and polyester, and on plastics such as polyurethane and polypropylene [32, 35];
   ii. in patient-care areas where immunocompromised patients are located, the use of upholstered furniture and furnishings should be minimized[26]; and
e) absence of seams:
   i. seams may trap bacteria and are difficult areas to clean.

New products are being developed that are coated with materials that retard bacterial growth (e.g., stainless steel coated with titanium dioxide,[96] glass coated with xerogel[97]). Although one anecdotal report has suggested that antimicrobial impregnation of hallway carpeting on a transplant unit may have retarded the growth of *Aspergillus* in the carpet,[98] there is no evidence that antimicrobial impregnation of items in the environment is associated with a reduced risk of infection or cross-transmission of microorganisms in health care. Product 'antibacterial' claims should be carefully evaluated before replacing items.[26]

3.2 Finishes in Health Care Settings (Walls, Flooring)

All finishes (e.g., wall treatments, floor finishes) in clinical areas should be chosen with cleaning in mind, especially where contamination with blood or body fluid is a possibility.[99] **Antimicrobial-treated**

surfaces are not recommended. An infection prevention and control risk assessment should be conducted by a multidisciplinary design group (which includes an Infection Control Professional - ICP) to ensure that all surfaces and finishes meet, as a minimum, the preferred surface characteristics, including but not limited to[92]:

a) ease of maintenance/repair and cleanability;
b) inability to support microbial growth;
c) smoothness (non-porous);
d) good sound absorption/acoustics;
e) inflammability (Class I fire rating);
f) durability;
g) sustainability;
h) presence of low levels of volatile organic compounds (VOC) to reduce off-gassing;
i) low smoke toxicity;
j) initial and life cycle cost-effectiveness;
k) slip-resistance;
l) ease of installation, demolition and replacement;
m) seamlessness;
n) resilience and impact resistance; and
o) non-toxic and non-allergenic.

3.3 Cloth and Soft Furnishings in Health Care Settings

Cloth furnishings have been shown to harbour higher concentrations of fungi than non-porous furnishings.[26, 69] In general, pathogenic bacteria cannot be effectively removed from the surfaces of upholstered furniture. Contaminated stuffing and foam cannot be decontaminated if breaks in fabric or leaks of body fluids or spills have occurred.

Cloth items such as curtains, pillows, mattresses and soft furnishings should[99]:

a) be seamless where possible or have double-stitched seams;
b) be easily accessed for cleaning;
c) have removable covers for cleaning;
d) have foam cores that are resistant to mould;
e) not be damaged by detergents and disinfectants;
f) be quick-drying; and
g) be maintained in good repair.

In all health care settings:

a) a regular cleaning regimen should be in place; any item that is visibly contaminated with blood or body fluids must be immediately cleaned and disinfected or removed from the setting;
b) the coverings on soft furniture must be cleanable with a hospital-grade disinfectant, except those furnishings in long-term care homes where the furniture is supplied by the resident[93];
c) replace worn, stained or torn items as soon as possible; and
d) do not use upholstered furniture and other cloth or soft furnishings that cannot be cleaned in care areas, particularly where immunocompromised patients are located.[26]

3.4 Carpeting

There is no evidence that carpeting influences health care-associated infection rates, except in immunocompromised populations.[26, 100] The choice of whether to use carpeting in a particular care area should be based upon[26]:

a) 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[101]); and
b) the risk of infection from dust and particulates containing environmental pathogens[26] in the patient population served by the area (e.g., burn units, intensive care units, operating rooms, transplant units).

Carpeting should not be used in areas that house clients/patients/residents that are sufficiently immunocompromised that they are at risk for invasive fungal infections (e.g., transplant units, some oncology units).[26] If carpeting is used in other areas, the following must be considered[26]:

a) carpet must be cleanable with hospital-grade cleaners and disinfectants;
b) carpet tiles may be easily removed, discarded and replaced;
c) 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[102]; carpeting that remains wet after 72 hours must be removed[26];
d) the type of material may influence the efficacy of disinfectants[93];
e) trained staff and specialized cleaning equipment and procedures are required for adequate carpet cleaning[26]; and
f) carpet age – older carpets accumulate deep dust which becomes surface and airborne dust after activity on the carpet.[103]

3.5 Integrity of Plastic Coverings

Outbreaks of health care-associated infections, such as VRE and Acinetobacter, have been linked to plastic covers on beds.[50, 63] Infection resulted when the covers become compromised and were no longer impervious to fluids.

Safe practices for plastic coverings, including mattress covers and pillow covers, include:

a) clean on a regular basis;
b) inspect for damage:
    i. mattress and pillow covers should be replaced when torn, cracked or have evidence of liquid penetration; the mattress or pillow should be replaced if it is visibly stained[26];
    ii. there must be a process to enable reporting, removal and replacement of torn, cracked or otherwise damaged coverings;
c) plastic coverings (e.g., mattress covers, keyboard covers) must not be cleaned with products that will render the covering permeable to fluids (e.g., phenolics, accelerated hydrogen peroxide) or will result in de-lamination of the cover (e.g., methanols).[104]

3.6 Electronic Equipment

Electronic equipment poses a challenge to environmental cleaning and disinfection. When purchasing new equipment, only keypads and monitoring screens that may be easily cleaned and disinfected should be considered. Plastic skins may be effective to cover computer keyboards, allowing ease of cleaning (see also, *plastic coverings*, above), but must be compatible with the health care setting's cleaning and disinfecting products.

Electronic equipment that cannot be adequately cleaned, disinfected or covered should not enter the immediate patient environment.

Recommendations:

1. ***Health care settings should have policies that include the criteria to be used when choosing finishes, furnishings and equipment for client/patient/resident 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 health care settings. [BIII]***
3. ***In all health care settings:***
    a. ***there must be a regular cleaning regimen in place; [BIII]***
    b. ***worn, stained, cracked or torn furnishings must be replaced when identified; [AII]***
    c. ***upholstered furniture and other cloth or soft furnishings that cannot be cleaned and disinfected must not be used in care areas, especially where immunocompromised patients are located; the health care 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 health care settings should:***
    a. ***be easily maintained and repaired;***
    b. ***be cleanable with hospital-grade detergents, cleaners and disinfectants (except furnishings in long-term care homes where the furniture is supplied by the resident); and***
    c. ***be smooth, nonporous, seamless and unable to support microbial viability. [BII]***
5. ***Cloth items should:***
    a. ***be easily maintained and repaired;***
    b. ***be seamless or double-stitched;***
    c. ***be resistant to mould;***
    d. ***be cleanable with hospital-grade detergents, cleaners and disinfectants; and***
    e. ***be quick-drying. [BII]***
6. ***Antimicrobial-treated surfaces are not recommended. [CIII]***
7. ***Do not carpet areas that house or serve immunocompromised patients or where there is a high likelihood of contamination with blood or body fluids. [BII]***
8. ***If used, carpet must:***
    a. ***be cleanable with hospital-grade cleaners and disinfectants;***
    b. ***be cleaned by trained staff using specialized cleaning equipment and procedures;***
    c. ***be removed and replaced when worn or stained; and***
    d. ***dry quickly to reduce the likelihood of mould accumulation. [BIII]***
9. ***Clean plastic coverings with compatible agents on a regular basis and replace if damaged. [BII]***
10. ***Equipment that cannot be adequately cleaned, disinfected or covered, including electronic equipment, should not be used in the care environment. [BII]***

4. Cleaning Agents and Disinfectants

> ***The key to cleaning is the use of friction to remove microorganisms and debris.***

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 key to cleaning is the use of friction to remove microorganisms and debris. 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 health care setting through a one-step process using a combined cleaner/disinfector product.

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. Only sterilization will kill all forms of microbial life.

4.1 Detergents and Cleaning Agents

Detergents remove organic material and suspend grease or oil. Equipment and surfaces in the health care setting must be cleaned with approved hospital-grade cleaners and disinfectants. Equipment cleaning/disinfection should be done as soon as possible after items have been used.

A variety of products from a number of suppliers can be used to achieve effective cleaning. It is important to follow the manufacturer's instructions when using cleaning agents. Disinfecting products used in the health care setting:

a) must be approved by Environmental Services, Infection Prevention and Control and Occupational Health and Safety;

b) must have a drug identification number (DIN) from Health Canada (http://www.hc-sc.gc.ca/dhp-mps/prodpharma/databasdon/index-eng.php);
c) must be used according to the manufacturers' recommendations for dilution, temperature, water hardness and use; and
d) must be used according to the product's Material Safety Data Sheet (MSDS).

4.2 Disinfectants

Disinfectants rapidly kill or inactivate most infectious agents. Disinfectants are only to be used to disinfect and must not be used as general cleaning agents, unless combined with a cleaning agent as a detergent-disinfectant.[13] **Skin antiseptics must never be used as environmental disinfectants** (e.g. alcohol-based hand rub, chlorhexidine).

1. Choosing a Disinfectant

The following factors influence the choice of disinfectant[26]:

a) the disinfectant must have a drug identification number (DIN) from Health Canada;
b) the nature of the item to be disinfected;
c) the innate resistance of expected microorganisms to the inactivating effects of the disinfectant;
d) the amount of organic soil present;
e) the type and concentration of disinfectant used;
f) duration of contact time required for efficacy at the usual room temperature of the health care setting;
g) if using a proprietary product, other specific indications and directions for use;
h) occupational health considerations:
    i. many surface disinfectants contain quaternary ammonium compounds (QUATs), phenolics, hydrogen peroxide or sodium hypochlorites which can cause skin and respiratory irritation;
    ii. disinfectants are one of the leading allergens affecting health care providers[105];
    iii. staff will be more likely to use products that are non-toxic and not irritating; and
i) environmental protection:
    i. consider products that are biodegradable and safe for the environment;
    ii. many disinfectants (e.g., QUATs) may be hazardous both during manufacture and when they are discharged into the waste stream, as they are not readily biodegradable.[105]

- See Box 2 for a list of hospital-grade disinfectants.

2. Using Disinfectants

When using a disinfectant:

a) it is most important that an item or surface be free from visible soil and other items that might interfere with the action of the disinfectant, such as adhesive products, before a disinfectant is applied, or the disinfectant will not work; most disinfectants lose their effectiveness rapidly in the presence of organic matter;
b) a hospital-grade disinfectant may be used for equipment that only touches intact skin; examples include intravenous pumps and poles, hydraulic lifts, blood pressure cuffs, apnoea monitors and sensor pads, electrocardiogram (ECG) machine/cables and crutches;
    - refer to Appendix F, '*Cleaning and Disinfection Decision Chart for Noncritical Equipment*', for a complete list of items that require cleaning followed by disinfection (or application of a cleaner/disinfector);
c) it is important that the disinfectant be used according to the manufacturer's instructions for dilution and contact time;
    - refer to Appendix E, '*Advantages and Disadvantages of Hospital-grade Disinfectants and Sporicides Used for Environmental Cleaning*', for disinfectants

commonly used in health care settings with their recommended concentrations and contact times;

d) minimize the contamination levels of the disinfectant solution and equipment used for cleaning; this can be achieved by ensuring proper dilution of the disinfectant, frequently changing the disinfectant solution and by not dipping a soiled cloth into the disinfectant solution (i.e., no 'double-dipping');
e) personal protective equipment must be worn appropriate to the product(s) used; and
f) there should be a quality monitoring system in place to ensure the efficacy of the disinfectant over time (e.g., frequent testing of product).

BOX 2: Hospital-grade Disinfectants

Hospital-grade disinfectants for use in all health care settings include:

- **Alcohols**
  - **60-90% ethyl or isopropyl alcohol**
- **Chlorine**
  - **Sodium hypochlorite (bleach)**
  - **Calcium hypochlorite**
- **Phenolics**
- **Quaternary Ammonium Compounds ('*QUATs*')**
- **Iodophors**
- **Accelerated Hydrogen Peroxide (AHP)**

Recommendations:

11. Cleaning and disinfection should be done as soon as possible after items have been used. [BII]

12. Cleaning and disinfecting products must:
   - ***a. be approved by Environmental Services, Infection Prevention and Control and Occupational Health and Safety;***
   - ***b. have a drug identification number (DIN) from Health Canada;***
   - ***c. be compatible with items and equipment to be cleaned and disinfected; and***
   - ***d. be used according to the manufacturer's recommendations. [BII]***

13. Disinfectants chosen for use in health care should:
   - ***a. be active against the usual microorganisms encountered in the health care setting;***
   - ***b. ideally require little or no mixing or diluting;***
   - ***c. be active at room temperature with a short contact time;***
   - ***d. have low irritancy and allergenic characteristics; and***
   - ***e. be safe for the environment. [BIII]***

14. Effective use of a hospital-grade disinfectant includes:
   - ***a. application of disinfectant only after visible soil and other impediments to disinfection have been removed;***
   - ***b. use on non-critical equipment;***
   - ***c. following the manufacturer's instructions for dilution and contact time;***
   - ***d. frequently changing disinfectant solution with no 'double-dipping' of cloths into disinfectant; and***

*e. **appropriate use of personal protective equipment, if required, to prevent exposure to the disinfectant. [BIII]***

5. New Equipment/Product Purchases

The administration of the health care setting is responsible for verifying that any item used in the provision of care to clients/patients/residents is capable of being cleaned and disinfected according to the most current standards and guidelines. Equipment that is used to clean and disinfect must also meet these standards.

Products used for cleaning and disinfection must be approved by those responsible for product selection, an individual from ES, Occupational Health and Safety and by an individual with infection prevention and control expertise (e.g., facility's infection prevention and control professionals).[17] The equipment that is to be cleaned must be compatible with the cleaning and disinfecting agents used in the health care setting, and the manufacturer's recommendations must be adhered to.

When purchasing new non-critical medical equipment:

a) do not purchase medical equipment that cannot be cleaned and disinfected according to the recommended standards[17];
b) when purchasing cleaning agents or equipment, consideration must be given to occupational health requirements, patient safety, and infection prevention and control and environmental safety issues[17];
c) all non-critical medical equipment that will be purchased and will be cleaned must include written item-specific manufacturer's cleaning and disinfection instructions. If disassembly or reassembly is required, detailed instructions with pictures must be included. Staff training must be provided on these processes before the medical equipment is placed into circulation[17] (e.g., patient lifts, specialized chairs and beds); and
d) 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).[50]

- See the Ministry of Health and Long-Term Care's '*Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings*'[17] for more information regarding the purchase of new medical equipment. Available online at: http://www.health.gov.on.ca/english/providers/program/infectious/pidac/pidac_mn.html.

Recommendations:

15. Non-critical medical equipment, including equipment provided by outside agencies, must be capable of being effectively cleaned and disinfected according to recommended standards. [BII]

16. Equipment that is used for cleaning and disinfecting must itself be cleaned and disinfected according to recommended standards. [BII]

17. Non-critical medical equipment, including equipment provided by outside agencies, must have written, item-specific manufacturer's cleaning and disinfection instruction. [BII]

II. Best Practices for Environmental Cleaning in All Health Care Settings

1. Principles of Infection Prevention and Control Related to Environmental Cleaning

1.1 Routine Practices

ES staff must adhere to Routine Practices when cleaning. The principles of Routine Practices are based on the premise that all clients/patients/residents, 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 clients/patients/residents and themselves from an unknown, undiagnosed infectious risk. Routine Practices related to environmental cleaning include:

a) hand hygiene;
b) use of personal protective equipment (PPE) when indicated; and
c) standardized cleaning protocols.

- See the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions for All Health Care Settings*'[6, 17] for more information regarding Routine Practices.

A. Hand Hygiene

Hand hygiene is the most important and effective infection prevention and control measure to prevent the spread of health care-associated infections. Hand hygiene must be practiced:

a) before initial patient/patient environment contact (e.g., before coming into the client/patient/resident room or bed space);
b) after potential body fluid exposure (e.g., after cleaning bathroom, handling soiled linen, equipment or waste); and
c) after patient/patient environment contact (e.g., after cleaning client/patient/resident room; after cleaning equipment such as stretchers; after changing mop heads).

It is important to **clean hands after removing gloves** as gloves do not provide complete protection against hand contamination.[106, 107] The use of gloves does not replace the need for hand hygiene.

The use of gloves does not replace the need for hand hygiene.

Alcohol-based hand rubs (ABHRs) are recommended when hands are not visibly soiled, as they provide for the rapid kill of most transient microorganisms and are less time-consuming than washing with soap and water.[108-112] ABHRs have been shown to be easier on the hands and cause less skin breakdown than using soap and water. ABHR should be used before entering and on leaving the client/patient/resident room, before eating and after activities that do not result in visible soiling of the hands, such as dusting, mopping and vacuuming.

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

For more information regarding hand hygiene:

- See the MOHLTC's '*Just Clean Your Hands*'[21] hand hygiene improvement program for hospitals, available via the justcleanyourhands.ca website at: http://www.justcleanyourhands.ca;
- See PIDAC's '*Best Practices for Hand Hygiene in All Health Care Settings*',[20] available online at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/ic_hh.html.

B. Cleaning and Disinfection Practices in Health Care Settings

Each health care setting must have policies and procedures that ensure that:

a) cleaning is a continuous event in the health care setting;
b) cleaning procedures incorporate the principles of infection prevention and control (see Section III - 1.1);
c) cleaning standards, frequency and accountability for cleaning are clearly defined;
d) cleaning schedules ensure that no area or item is missed from routine cleaning;
e) statutory requirements are met in relation to:
   i. the safe disposal of clinical waste:
      - '*The Management of Biomedical Waste in Ontario*'[2]; available online at: http://www.google.ca/url?sa=t&source=web&ct=res&cd=1&url=http%3A%2F%2Fwww.ene.gov.on.ca%2Fenvision%2Fgp%2F425e.pdf&ei=D3-1ScSqJpiLmQe7IfTiBQ&usg=AFQjCNE1ecLOCFCpr5ZOTBNDzgwR_qxKXg&sig2=ieCJ_41VCL8ysdQfY7FAAg
      - *Occupational Health & Safety Act* and Regulations,[24] for safe disposal of waste; available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm
   ii. the safe handling of linen:
      - *Occupational Health & Safety Act* and Regulations,[24] for staff safety when handling contaminated linen; available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90o01_e.htm
      - Workplace Hazardous Materials Information System (WHMIS),[113] available online at: http://www.labour.gov.on.ca/english/hs/pdf/whmis.pdf
      - Canadian Standards Association (CSA), for standards related to forklift operation, hoists, safety equipment, support equipment such as boilers, etc.; available online at: http://www.csa.ca/Default.asp?language=english
      - *Transportation of Dangerous Goods Act*[114] applicable to receipt of some laundry and waste water treatment chemicals, available online at: http://laws.justice.gc.ca/en/T-19.01/
   iii. food hygiene:
      - *Health Protection and Promotion Act,*[115] dealing with food premises, available online at: http://www.search.e-laws.gov.on.ca/en/isysquery/dc8f2ea6-ad42-4602-8ddc-0667943162a9/1/frame/?search=browseStatutes&context=
   iv. pest control:
      - *Health Protection and Promotion Act*,[22] available online at: http://www.e-laws.gov.on.ca/html/statutes/english/elaws_statutes_90h07_e.htm
      - *Pesticides Act, O. Reg. 63/09,*[116] for pest control; available online at: http://www.elaws.gov.on.ca/html/source/regs/english/2009/elaws_src_regs_r09063_e.htm
   v. long-term care homes' requirements for handling waste, linen, food and dealing with pests:
      - *'Long-Term Care Homes Program Manual',*[23] available online at: http://www.health.gov.on.ca/english/providers/pub/manuals/ltc_homes/ltc_homes_mn.html

Routine Health Care Cleaning Practices

Routine cleaning practices are practices that are used wherever cleaning is done. Routine cleaning is necessary to maintain a specific measure of cleanliness, i.e., Hotel Clean, Hospital Clean. Routine cleaning practices must be effective and consistent to reduce the transmission of microorganisms.

The frequency of cleaning is dependent upon the risk classification of the surface or item to be cleaned. For example, a telephone in a client/patient/room should be cleaned at least daily because it may be touched by many individuals, including those with an infectious illness. A telephone in a manager's office may only be cleaned periodically as it is used primarily by one person.

- See Section III for details regarding routine cleaning practices.

Hotel Clean is a measure of cleanliness based on visual appearance that includes dust and dirt removal, waste disposal and cleaning of windows and surfaces. Hotel Clean is the basic cleaning that takes place in all areas of a health care setting.

- See Box 3 for components of Hotel Clean.

Hospital Clean is a measure of cleanliness routinely maintained in care areas of the health care setting.[4] Hospital Clean is '*Hotel Clean*' with the addition of disinfection, increased frequency of cleaning, auditing and other infection control measures in client/patient/resident care areas.

- See Box 4 for components of Hospital Clean.

BOX 3: Components of 'Hotel Clean'

- **Floors and baseboards are free of stains, visible dust, spills and streaks**
- **Walls, ceilings and doors are free of visible dust, gross soil, streaks, spider webs and handprints**
- **All horizontal surfaces are free of visible dust or streaks (includes furniture, window ledges, overhead lights, phones, picture frames, carpets etc.)**
- **Bathroom fixtures including toilets, sinks, tubs and showers are free of streaks, soil, stains and soap scum**
- **Mirrors and windows are free of dust and streaks**
- **Dispensers are free of dust, soiling and residue and replaced/replenished when empty**
- **Appliances are free of dust, soiling and stains**
- **Waste is disposed of appropriately**
- **Items that are broken, torn, cracked or malfunctioning are replaced**

BOX 4: Components of 'Hospital Clean'

Hospital Clean consists of:

HOTEL CLEAN
+

- **High-touch surfaces in client/patient/resident care areas are cleaned and disinfected with a hospital-grade disinfectant**
- **Non-critical medical equipment is cleaned and disinfected between clients/patients/residents**

+
CLEANING PRACTICES ARE PERIODICALLY MONITORED AND AUDITED WITH FEEDBACK AND EDUCATION

NOTE: Frequency of Hospital Clean is determined according to the Risk Stratification Matrix in Appendix B

C. Outbreaks

There may be a requirement for additional or enhanced cleaning of a health care setting during an outbreak, in order to contain the spread of the microorganism causing the outbreak. Policies and procedures regarding staffing in ES departments should allow for *surge capacity* (i.e., additional staff, supervision, supplies, equipment) during outbreaks as determined by the outbreak management committee. The outbreak management committee should include, among other departments, representation from Environmental Services who will lead the coordination of the department's activities.

D. Personal Protective Equipment (PPE) for Infection Prevention and Control

Personal protective equipment (PPE) for health care providers and other staff 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. Cleaning staff should wear PPE:

a) for protection from microorganisms;
b) for protection from chemicals used in cleaning; and
c) to prevent transmission of microorganisms from one patient environment to another.

Health care settings must ensure that:

a) PPE is sufficient and accessible for all cleaning staff[13] for Routine Practices, Additional Precautions and for personal protection from chemicals used in cleaning;
b) WHMIS training regarding appropriate handling of biohazardous material is provided;
c) individualized training is provided in the correct use, application and removal of PPE; and
d) staff who are required to wear N95 respirators for airborne infection isolation are fit-tested in accordance with a respiratory protection program that is compliant with the Ministry of Labour and Canadian Standards Association requirements.[117]

Personal protective equipment is used to prevent contact with blood, body fluids, secretions, excretions, non-intact skin or mucous membranes, and includes:

a) gloves when there is a risk of hand contact with blood, body fluids, secretions or excretions or items contaminated with these;
b) gown if contamination of uniform or clothing is anticipated; and
c) mask and eye protection or face shield where appropriate to protect the mucous membranes of the eyes, nose and mouth during activities involving close contact (i.e., within two metres) with clients/patients/residents likely to generate splashes or sprays of secretions (e.g., coughing, sneezing).

- For more information about PPE, see the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions for All Health Care Settings*'.[6]

1. Use of Gloves for Environmental Services

Prolonged wearing of gloves is not recommended both 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 risk of tears.

Inappropriate use of gloves, such as going from room to room in care areas with the same pair of gloves, facilitates the spread of microorganisms. **Gloves must be removed immediately after the activity for which they were used** and, if disposable, discarded.[19, 118] In addition:

a) gloves should be used as an additional measure, not as a substitute for hand hygiene;
b) do not wash or re-use disposable gloves;
c) change or remove gloves after contact with a client/patient/resident environment and before

> - ***Gloves must be removed and hand hygiene must be performed on leaving each client/patient/resident room or bed space.***
> - ***Housekeeping staff must not walk from room to room and other areas of the health care facility wearing the same pair of gloves.***

contact with another client/patient/resident environment; and
d) 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.[3] The glove requirements identified in the MSDS must be followed when using a chemical agent. In general:

a) disposable vinyl gloves may be used for routine daily cleaning and disinfecting procedures in client/patient/resident care areas and public washrooms;
b) nitrile gloves are recommended for wet work of long duration when durability is required, for terminal cleaning and for contact with certain chemical powders and solutions;
c) household utility gloves are only acceptable for cleaning in non-patient care areas, with the exception of public washrooms; and
d) heavy duty gloves are recommended if the task has a high risk for percutaneous injury (e.g., sorting linen, handling waste).

- ➢ See the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions in All Health Care Settings*'[6] for more information about the use of gloves.

2. <u>Use of Gowns, Masks and Eye Protection for Environmental Services</u>

A gown, mask and eye protection are not required for routine cleaning activities. PPE requirements identified on Material Safety Data Sheets (MSDSs) must be followed when using chemical agents. For staff working in laundry facilities, barrier gowns or Gore-Tex® (fluid-resistant) aprons and sleeves may be worn with a face shield when there may be a risk of splash.[119]

- ➢ See the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions in All Health Care Settings*'[6] for more information about the use of gowns, masks and eye protection.

3. <u>Removal of PPE</u>

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

- ➢ See the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions in All Health Care Settings*' for more information about correct removal of PPE.[6]

1.2 Additional Precautions

Additional Precautions (i.e. Contact Precautions, Droplet Precautions and Airborne Precautions) are infection prevention and control interventions to be used in addition to Routine Practices to protect staff and clients/patients/residents by interrupting the transmission of specific infectious agents. Clients/patients/residents 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 must comply with these precautions when entering the room.

- ➢ See the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions in All Health Care Settings*'[6] for more information about Additional Precautions and the use of PPE.

Additional Health Care Cleaning Practices

In addition to routine cleaning, additional cleaning practices may be required in health care settings for microorganisms of special environmental significance due to their survival in the environment and/or ease of transmission (e.g. VRE, *C. difficile*).

- ➢ See Section III for details regarding additional cleaning practices.

Recommendations:

18. Environmental Services staff must adhere to Routine Practices and Additional Precautions when cleaning. [BII]
19. Environmental Services staff must follow best practices for hand hygiene. [AII]
20. Each health care setting must have policies and procedures to ensure that cleaning:
   a. takes place on a continuous and scheduled basis;
   b. incorporates principles of infection prevention and control;
   c. clearly defines cleaning responsibilities and scope;
   d. meets all statutory requirements; and
   e. allows for surge capacity during outbreaks. [BIII]
21. Personal protective equipment (PPE) must be:
   a. sufficient and accessible for all cleaning staff;
   b. worn as required by Routine Practices, Additional Precautions and MSDSs when handling chemicals; and
   c. removed immediately after the task for which it is worn. [BII]
22. Gloves must be removed and hand hygiene performed on leaving each client/patient/resident room or bed space. Soiled gloves must not be worn when walking from room to room or other areas of the health care facility. [AIII]

2. Cleaning Best Practices for Client/Patient/Resident Care Areas

Good housekeeping practices are essential for reducing the risk of transmitting infectious diseases. This will contribute to a culture of safety by providing an atmosphere of general cleanliness and good order. All those using the health care premises have a right to assume that the environment is one where hazards are adequately controlled and that, where appropriate, they receive any necessary information to enable them to safeguard themselves and others from disease.[12]

Just because it 'looks' clean doesn't mean it isn't contaminated by bacteria or viruses.

Housekeeping in the health care setting should be performed on a routine and consistent basis to provide for a safe and sanitary environment. Maintaining a clean and safe health care environment is an important component of infection prevention and control. Despite this, however, there is little evidence of acceptable quality upon which to base guidance related to the maintenance of hospital environmental hygiene. Current standards for assessing hospital hygiene recommend the use of visible cleanliness as a performance criterion,[12, 13, 120-122] despite the fact that visual assessment alone is not an adequate indicator of cleaning efficacy.[123]

- ➢ See Section II - 8, '*Assessment of Cleanliness and Quality Control*', for more information about assessing cleaning.
- ➢ For long-term care homes, see applicable legislation and the Long-Term Care Program Manual[23] for legal requirements related to housekeeping services, available online at: http://www.health.gov.on.ca/english/providers/pub/manuals/ltc_homes/ltc_homes_mn.html.

2.1 General Principles

Cleaning best practices are designed to meet the following needs:

a) the primary focus must remain the protection of the client/patient/resident, staff and visitors;

b) the practices must help minimize the spread of infections;
c) the practices are understandable and attainable;
d) the practices incorporate workflow measurement to guide human resource issues; and
e) the practices must be reviewed as often as required to keep abreast of changes in the health care environment.

A. Resources for Environmental Cleaning

All health care settings must devote adequate resources to ES that include:

a) one individual with assigned overall responsibility for the care of the physical facility[124];
b) written procedures for cleaning and disinfection of client/patient/resident areas and equipment that include:
    i. defined responsibility for specific items and areas;
    ii. clearly defined lines of accountability;
    iii. procedures for daily and terminal cleaning and disinfection;
    iv. procedures for cleaning in construction/renovation areas;
    v. procedures for specific environmentally-hardy microorganisms such as VRE and *C.difficile;*
    vi. procedures for outbreak management; and
    vii. cleaning and disinfection standards and frequency;
c) adequate human resources to allow thorough and timely cleaning and disinfection;
d) priority for cleaning given to patient care areas rather than to administrative and public areas;
e) provision for additional environmental cleaning capacity during outbreaks that does not compromise other routine patient care cleaning[18];
f) education and continuing education of cleaning staff;
g) monitoring of environmental cleanliness and results reported back appropriately to become a part of the employee's performance review[18]; result aggregates reviewed by facility management;
h) supervision of cleaning staff by those who are trained and knowledgeable in cleaning standards and practices; and
i) ongoing review of procedures.

These cleaning practices apply to all health care settings whether cleaning is conducted by in-house staff, or contracted out. They are designed to be used as a standard against which in-house services can be benchmarked, as the basis for specifications if cleaning services are contracted out and as the framework for auditing of cleaning services by cleaning supervisors and managers.

1. Contracted Services

There is no evidence to suggest that the source of Environmental Services labour (whether provided in-house or contracted out) is a factor that determines the success of environmental cleaning in a health care setting. When general housekeeping services are contracted out, the contract must clearly outline the infection control-related responsibilities. These should include not only the housekeeping procedures, but also the contracting agency's responsibility for employee health and mandatory training.[124] Contract staff must work collaboratively with Nursing, Infection Prevention and Control and Occupational Health and Safety to ensure the safety of clients/patients/residents, staff and visitors; contractual barriers that prevent this from happening should be removed.

If housekeeping services are contracted out, the following should be included in the legal agreement with the service provider:

a) the Occupational Health and Safety policies of the contracting services must be consistent with the facility's Occupational Health and Safety policies as they relate to infection prevention and control, including immunization (including annual influenza vaccination); transparent sharing of information related to work place exposure incidents; access to staff health policies and measures related to Additional Precautions; and outbreak investigation and problem-solving, as required under the Communicable Disease Surveillance Protocols (available

online at:
http://oha.ca/client/oha/oha_lp4w_lnd_webstation.nsf/page/Communicable+Diseases+Surveillance+Protocols;

b) recognition that ever-changing activity levels and cleaning protocols will potentially impact on the cost of service; contracts should support (without penalty or financial barrier) a proactive and cooperative environment to consistently implement appropriate cleaning measures; and
c) there should be clear expectations regarding the levels of cleaning frequency and standards.

2. Staffing Levels

Adequately staffed Environmental Services departments are one of the most important factors that govern the success of environmental cleaning in a health care setting. Staffing levels must be appropriate to each department of the health care facility, with the ability to increase staffing in the event of outbreaks.

General staffing levels may be calculated by adding the average time taken for a worker to complete individual tasks.[125] Average cleaning time is the normal time required for a qualified worker, working at a comfortable pace, to complete an operation when following a prescribed method.[125] 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.

Supervisory staffing levels must be appropriate to the number of staff involved in cleaning (e.g., one supervisor to 15-20 workers in patient care areas of an acute care facility). Supervisory staff have responsibilities under the *Occupational Health and Safety Act* to ensure staff training and compliance when using PPE. Supervisors are also responsible for training and auditing staff on cleaning procedures. Adequate supervisory staffing levels will help ensure that these requirements are being met.

The following factors should be considered when determining appropriate staffing levels for cleaning and supervisory staff in a health care setting:

a) Building Factors

- age of the facility – older buildings are harder to clean
- design of the facility – e.g., amount of walking required to complete a task
- size of the facility
- climate
- season
- exposure of facility to outside dust and soil, e.g., construction site
- type of floors and walls
- presence of carpet and upholstered furniture

b) Occupancy Factors

- occupancy rate and volume of cases
- patient mix/type of care in the area (e.g., acute care, long-term care, clinic) vs. no care in the area (e.g., public area)
- frequency of cleaning required in an area (e.g., once daily vs. after each case)
- square metres to be cleaned in patient care areas
- square metres to be cleaned in non-patient care areas
- admissions/discharges by unit/area – more rapid turnover requires a shorter turnaround time for rooms and equipment
- facility rates of VRE and CDAD – additional staff will be required due to extra cleaning and disinfection required for VRE and *C.difficile* (see Section III - 2.1) as well as the requirement to put on and remove PPE

- Additional Precautions rooms – extra time will be required to put on and remove PPE
- presence of outbreaks

c) Equipment Factors

- type of cleaning tools/equipment available (e.g., automated floor cleaner vs. mop and bucket)
- methodology required for cleaning (i.e., equipment, chemicals, materials and physical ergonomics)
- placement of custodial closets

d) Training Factors

- amount and level of training given to new staff will influence supervisory staffing levels
- auditing activities will influence supervisory staffing levels
- staff experience (inexperienced staff will work slower than experienced staff)

e) Legislative Requirements

- amount of regulatory responsibility a supervisor may have

➢ For more information about calculating cleaning times and staffing levels, see the International Sanitary Supply Association's booklet, '*The Official ISSA 447 Cleaning Times*' (3rd edition, February 2007).[125]

2.2 Frequency of Routine Cleaning

The frequency of cleaning and disinfecting individual items or surfaces in a particular area or department depends on:

a) whether surfaces are high-touch or low-touch:
   ➢ see below, '*Frequency of Contact with Surfaces*' for more information regarding high-touch and low-touch surfaces;
b) the type of activity taking place in the area and the risk of infection associated with it (e.g., critical care areas vs. meeting room);
c) the vulnerability of clients/patients/residents housed in the area:
   ➢ see below, '*Vulnerability of the Client/Patient/Resident Population*' for more information regarding susceptibility to infection; and
d) the probability of contamination based on the amount of body fluid contamination surfaces in the area might have or be expected to have:
   ➢ see below, '*Probability of Contamination of Surfaces in the Health Care Environment*' for more information regarding body fluid contamination of surfaces.

Using these criteria, **each area or department in a health care setting may be evaluated and assigned a risk score for cleaning purposes**, as illustrated in Appendix B, '*Risk Stratification Matrix to Determine Frequency of Cleaning*'. Each score will relate to a particular level of routine cleaning frequency. As the activity or vulnerability of clients/patients/residents in an area changes, the risk score will change as well, impacting on the cleaning frequency.

A. Frequency of Contact with Surfaces

All surfaces in a health care setting have the potential to harbour pathogenic microorganisms. The potential for exposure to pathogens is based on the frequency of contact with a contaminated surface and the type of activity involved. For example, a conference room table would have less potential for exposure to pathogens than the doorknob in a client/patient/room. High-touch surfaces will require more frequent cleaning regimen.

Most, if not all, environmental surfaces will be adequately cleaned with soap and water or a detergent/disinfectant, depending on the nature of the surface and the type and degree of contamination.[26] The process and products used for cleaning and disinfection of surfaces and medical equipment must be compatible with the surfaces/equipment.[126]

The following designations should be used in the Risk Stratification Matrix to determine the frequency of cleaning (refer to Appendix B, '*Risk Stratification Matrix to Determine Frequency of Cleaning'*):

1. **High-touch Surfaces**

   High-touch surfaces are those that have frequent contact with hands. Examples include doorknobs, elevator buttons, telephones, call bells, bedrails, light switches, computer keyboards, monitoring equipment, haemodialysis machines, wall areas around the toilet and edges of privacy curtains.

   High-touch surfaces in care areas require more frequent cleaning and disinfection than minimal contact surfaces.[26] Cleaning and disinfection is usually done at least daily and more frequently if the risk of environmental contamination is higher (e.g., intensive care units).

2. **Low-touch Surfaces**

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

   Low-touch surfaces require cleaning on a regular (but not necessarily daily) basis, when soiling or spills occur, and when a client/patient/resident is discharged from the health care setting.[26] Many low-touch surfaces may be cleaned on a periodic basis rather than a daily basis if they are also cleaned when visibly soiled.

B. Vulnerability of the Client/Patient/Resident Population

Different populations of clients/patients/residents have differing vulnerabilities based on their susceptibility to infection. In some populations, such as bone marrow transplant or burn patients, susceptibility to infection is very high and may be impacted by their environment. The frequency of cleaning may be higher in areas with vulnerable client/patient/resident populations.

The following designations should be used in the Risk Stratification Matrix to determine the frequency of cleaning (refer to Appendix B, '*Risk Stratification Matrix to Determine Frequency of Cleaning'*):

1. **More Susceptible**

   These are clients/patients/residents who are more susceptible to infection due to their medical condition or lack of immunity. These include those who are immunocompromised (e.g., oncology patients; those in transplant and chemotherapy units; neonates (level 2 and 3 nurseries); those who have severe burns, i.e., requiring care in a burn unit); and those undergoing invasive or operative procedures (e.g., haemodialysis).

2. **Less Susceptible**

   For the purpose of risk stratification for cleaning, all other individuals are classified as less susceptible.

C. Probability of Contamination of Items and Surfaces in the Health Care Environment

The probability that a surface, piece of equipment or care area will be contaminated is based on the activity in the area, the type of pathogens involved and the microbial load. Areas that are heavily soiled with blood or other body fluids will require more frequent cleaning and disinfection than areas that are minimally soiled or not soiled. (e.g., lounges, offices).

The following designations should be used in the Risk Stratification Matrix to determine the frequency of cleaning (refer to Appendix B, '*Risk Stratification Matrix to Determine Frequency of Cleaning'*):

1. **<u>Heavy Contamination</u>**

   An area is considered to be heavily contaminated if surfaces and/or equipment are exposed to copious amounts of blood or other body fluids (e.g., birthing suite, autopsy suite, cardiac catheterization laboratory, burn unit, haemodialysis unit, Emergency Department, bathroom if the client/patient/resident has diarrhea or is incontinent).

2. **<u>Moderate Contamination</u>**

   An area is considered to be moderately contaminated if surfaces and/or equipment are contaminated with blood or other body fluids as part of routine activity (e.g., patient/resident room, bathroom if client/patient/resident is continent) and the contaminated substances are contained or removed (e.g., wet sheets). All client/patient/resident rooms and bathrooms should be considered to be, as a minimum, moderately contaminated.

3. **<u>Light Contamination</u>**

   An area is considered to be lightly contaminated or not contaminated if surfaces are not exposed to blood, other body fluids or items that have come into contact with blood or body fluids (e.g., lounges, libraries, offices).

2.3 Equipment

This document deals with the cleaning and disinfection of non-critical equipment and devices that only come into contact with intact client/patient/resident's skin or the environment.

- See the Ministry of Health and Long-Term Care's '*Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings*'[126] for cleaning all other types of equipment, available online at: http://www.health.gov.on.ca/english/providers/program/infectious/pidac/pidac_mn.html.

Non-critical medical equipment that is within the client/patient/resident's environment and used between clients/patients/residents (e.g. imaging equipment, electronic monitoring equipment, commode chairs) requires cleaning and disinfection after each use. Selection of new equipment must include considerations related to effective cleaning and disinfection. The health care setting should have written policies and procedures for the appropriate cleaning and disinfection of equipment that clearly define the frequency and level of cleaning and which assign responsibility for cleaning. A system should be in place to clearly identify equipment which has been cleaned and disinfected.

- Refer to Appendix G, '*Recommended Minimum Cleaning and Disinfection Level and Frequency for Non-critical Client/Patient/Resident Care Equipment and Environmental Items*', for a sample cleaning chart for non-critical medical equipment and other items.

Recommendations:

23. ***Housekeeping in the health care setting should be performed on a routine and consistent basis to provide for a safe and sanitary environment. [BIII]***
24. ***Adequate resources must be devoted to Environmental Services in all health care settings that include:***
    a. ***single individual with assigned responsibility for the care of the physical facility;***
    b. ***written procedures for cleaning and disinfection of care areas and equipment that include:***
       i. ***defined responsibility for specific items and areas;***
       ii. ***procedures for daily and terminal cleaning;***
       iii. ***procedures for cleaning in construction/renovation areas;***
       iv. ***procedures for cleaning and disinfecting areas contaminated with VRE and C.difficile;***
       v. ***procedures for outbreak management;***

vi. cleaning standards and frequency;

c. adequate human resources to allow thorough and timely cleaning and disinfection;

d. education and continuing education of cleaning staff;

e. monitoring of environmental cleanliness; and

f. ongoing review of procedures. [BII]

25. If housekeeping services are contracted out, the Occupational Health and Safety policies of the contracting services must be consistent with the facility's Occupational Health and Safety policies. [BII]

26. 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]

27. Cleaning schedules should be developed, with frequency 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/residents housed in the area; and the probability of contamination. [BIII]

28. Non-critical medical equipment requires cleaning and disinfection after each use. [AII]

29. Each health care setting should have written policies and procedures for the appropriate cleaning of non-critical medical equipment that clearly defines the frequency and level of cleaning and which assigns responsibility for the cleaning. [BIII]

3. Laundry and Bedding

Soiled linen is rarely implicated in the transmission of infections,[127] although sheets and pyjamas have been shown to harbour microorganisms that readily proliferate in the moist, warm environment next to an individual's body.[128] 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 must be followed if the facility does its own laundry.

- See the *Occupational Health and Safety Act*, R.S.O. 1990, c.0.1. including *Health Care and Residential Facilities Ontario Regulation 67/93*[24] for legal requirements relating to laundry, available online at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_930067_e.htm.
- For long-term care homes, refer to applicable legislation and the Long-Term Care Homes Program Manual[23] for legal requirements related to laundry services, available online at: http://www.health.gov.on.ca/english/providers/pub/manuals/ltc_homes/ltc_homes_mn.html.

3.1 Laundry Area

Laundry facilities (including health care settings that do their own laundry) must have policies that will ensure that:[3, 26]:

a) laundry equipment is used and maintained according to manufacturers' instructions;
b) gross soil is removed before washing and proper washing and drying procedures are used;
c) there is an established procedure to determine when laundry should be sorted in the laundry facility (i.e., before or after washing);
d) laundry is cleaned at a temperature of at least 71.1°C (160°F) if cold water detergents are not used[3];
e) cloth linen bags are washed after each use and can be washed in the same cycle as the linen contained in them; and
f) clean laundry is packaged, transported and stored by methods that will ensure their cleanliness and protect them from dust and soil during interfacility loading, transport and unloading.

3.2 Soiled Linen

All linen that is soiled with blood, body fluids, secretions or excretions should be handled using the same precautions, regardless of source or health care setting[3, 26, 129]:

a) remove gross soil (e.g., faeces) with a gloved hand and dispose into toilet or hopper; do not remove excrement by spraying with water;
b) bag or otherwise contain contaminated laundry at the point-of-care;
c) do not sort or pre-rinse contaminated laundry in patient-care areas;
d) personal laundry or items (e.g., in long-term care) should be bagged separately at the point of collection, or laundered by family members;
e) handle contaminated laundry with minimum agitation to avoid contamination of the air, surfaces and persons (e.g., roll up)[130];
f) contain wet laundry before placing in laundry bag (e.g., wrap in a dry sheet or towel); water soluble bags and 'double-bagging' are not necessary and not recommended;
g) laundry carts or hampers used to collect or transport soiled linen need not be covered unless otherwise required by Regulation (*see legislation, above*);
h) linen bags should be tied securely and not be over-filled;
i) 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[129]:
   i. ensure that laundry bags are securely bagged and tightly closed before placing the filled bag into the chute;
   ii. do not place loose items in the chute;
   iii. laundry chutes should be maintained under negative pressure and discharge into the soiled linen collection area; and
   iv. laundry chutes should be cleaned on a regular basis;
j) routine laundering practices are adequate for laundering all linens, regardless of source; special handling of linen for clients/patients/residents on Additional Precautions is not required.[131]

3.3 Clean Linen

Clean linen should be transported and stored in a manner that prevents inadvertent handling or contamination by dust and other airborne particles. Each client/patient/resident 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.[92]

3.4 Laundry Staff Protection

Protection of staff in laundry areas includes[3]:
a) training for all health care providers and laundry staff in the procedures for handling of soiled linen that includes infection prevention and control and WHMIS training;
b) dedicated hand washing sink that is readily available in laundry areas;
c) the provision of appropriate protective equipment, e.g., gloves, gowns or aprons, face protection, to provide protection from potential cross-infection when handling soiled linen;
d) hand hygiene whenever gloves are changed or removed;
e) 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; and
f) immunization of laundry staff against hepatitis B due to the high risk of sharps injury.

Recommendations:

30. ***If the facility does its own laundry, published laundry regulations must be followed.***
31. ***There must be clear separation between clean and dirty laundry. [AII]***
32. ***There must 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]***
33. ***There must be designated areas for storing clean linen. [BII]***
34. ***Routine laundering practices are adequate for laundering all linens, regardless of source. [BII]***

4. Waste Management and Disposal of Sharps

Biomedical waste is contaminated, infectious waste from a health care 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.[2, 7, 24]

Written policies and procedures for the management of biomedical waste from health care settings should be developed based on provincial[2, 7] and municipal regulations and legislation[132] and should address issues such as the collection, storage, transport, handling and disposal of contaminated waste, including sharps and biomedical waste.

Waste handlers should wear protective apparel appropriate to the risk (e.g., gloves, protective footwear). A dedicated hand washing sink must be available to waste handlers. It is strongly recommended that non-immunized waste handlers be offered hepatitis B immunization.[3]

Staff who clean reusable waste containers, carts, final storage areas, or biomedical waste treatment equipment, shall wear[132]:

a) coveralls, gowns or aprons;
b) heavy-duty, waterproof gloves; and
c) protective goggles or face shields.

4.1 Collection of Waste

Legislation dictates that biomedical waste be handled and disposed of in a manner that avoids transmission of potential infections[2, 3, 24, 26, 124]:

a) biomedical waste shall be segregated, at the point of generation,[132] into either a plastic bag or rigid container with a non-removable lid; the container shall be capable of withstanding the weight of the biomedical waste without tearing, cracking or breaking[2];
b) waste bags should be of a thickness that will resist puncture, leaking and breaking,[132] and they should be waterproof;
c) double-bagging should only be necessary when the first bag becomes stretched or damaged, or when waste has spilled on the exterior[132]; and
d) when a bag is three-quarters full, it should be closed and tied in a manner that prevents contents from escaping.[132]

Waste should be segregated according to the categories listed in Table 2. 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 2: Disposal Streams for Biomedical and General Waste

Waste Category	Colour Code[2, 132]	Examples	Disposal
Anatomical waste	red	Tissues, organs, body parts	▪ Incineration ▪ Must be packaged in a sealed, impervious container that is refrigerated or frozen until disposal ▪ Must never be kept longer than one week
Microbiologic waste	yellow	Diagnostic specimens, cultures, vaccines	▪ Incineration, *or* ▪ Treatment that is capable of inactivating spores (e.g., autoclave), then landfill[133] ▪ Publicly funded vaccines must be returned to Ontario Government Pharmacy
Fluid waste	yellow	Drainage collection units and suction container contents, blood, blood products, bloody body fluids and other materials that will release liquid or semi-liquid blood if compressed	▪ Sanitary sewer if permitted by municipal bylaws, *or* ▪ Incineration, *or* ▪ Treatment that is capable of inactivating spores (e.g., autoclave), then landfill
Sharps	Yellow *or* Red if incinerated	Needles, syringes, lancets, blades, clinical glass	▪ Incineration, *or* ▪ Treatment that is capable of inactivating spores, then landfill
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	▪ Landfill

- For **cytotoxic waste handling**, see:
  - the *Environmental Protection Act, R.S.O 1990*, Part V, Sections 19 and 27; Part XVII, Section 197:
    - Guideline C-4, '*The Management of Biomedical Waste in Ontario*'[2] (available online at: http://www.ene.gov.on.ca/envision/gp/425e.pdf.
  - The *Occupational Health & Safety Act, R.S.O. 1990*, c.0.1 including *Health Care and Residential Facilities O. Reg. 67/93*, Sec. 97[24] (available online at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_930067_e.htm.
  - the Canadian Standards Association's '*Handling of Waste Materials in Health Care Facilities and Veterinary Health Care Facilities*' (Z317.10-01).

- For **pharmaceutical waste handling**, see the Canadian Standards Association's '*Handling of Waste Materials in Health Care Facilities and Veterinary Health Care Facilities*' (Z317.10-01).

- For **chemical waste handling**, see:
  - the *Environmental Protection Act*, *R.S.O 1990*[134]:
    - O. Reg 461/05 amending Reg. 347, R.R.O. 1990 deals with hazardous and chemical waste (available online at: http://www.e-laws.gov.on.ca/html/source/regs/english/2005/elaws_src_regs_r05461_e.htm);
    - O. Reg 558/00 deals with hazardous and liquid chemical waste (available online at: http://www.e-laws.gov.on.ca/html/source/regs/english/2000/elaws_src_regs_r00558_e.htm);
    - O. Reg 718/94 deals with sterilants (available online at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_940718_e.htm).
  - the Canadian Standards Association's '*Handling of Waste Materials in Health Care Facilities and Veterinary Health Care Facilities*' (Z317.10-01).

4.2 Storage of Waste

Waste must be placed in appropriate containers at the point-of-care/use and stored in a designated enclosed room with access limited to authorized staff. Refrigerated space at or below 4°C shall be provided for storage of anatomical waste and biomedical waste if stored for more than four days.[132] Biomedical waste storage areas shall be locked, except where authorized staff are on hand.[132]

Segregated waste should be removed to central holding areas at frequent intervals and be stored in leak-proof bins that are cleaned and disinfected prior to re-use. Waste bags should never be stored directly on the floor. Waste should be disposed of in the safest, most economical manner permitted in the health care setting locale.[124] Provincial regulations for specific storage requirements shall be followed.[2, 24]

Health care facilities shall have a contingency plan for dealing with the storage of refrigerated waste in the event of[132]:

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

4.3 Transport of Waste

All waste should be transported within the health care setting incorporating the following procedures:

a) clearly define transport routes;
b) minimize manual handling of waste[132];
c) avoid crossing through clean zones, public areas or client/patient/resident care units[132];
d) avoid transporting waste on the same elevator as clients/patients/residents, sterile instruments/supplies or food serving carts; if a dedicated elevator is not available, waste should not be transported at the same time as clients/patients/residents are transported; and
e) transport waste in leak-proof carts which are cleaned on a regular basis.

All external transportation of infectious waste must comply with Transport Canada's *Transportation of Dangerous Goods Act and Regulation*.[114] Waste must be transported by a certified waste hauler who provides a certificate of approval. Where the primary biomedical waste container is a sharps container or a rigid container with a non-removable lid, additional packaging or containment of the waste is not necessary for off-site transportation. Where the primary container is a plastic bag, the bag shall be placed into a rigid, leak-proof outer container for transportation off-site.[2]

4.4 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[24, 26, 124]:

a) using safety engineered medical devices, such as needleless devices[135];
b) NEVER re-capping a used needle[132];
c) NEVER reaching into waste or sharps containers;
d) the provision of rigid, puncture-resistant sharps containers at or near the point-of-use to permit safe one-handed disposal;
e) replacing sharps containers when they are three-quarters full or the sharps have reached the fill line and securely closing the lid;
f) handling laundry with care; and
g) 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).

ES staff must 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.

A procedure for safely disposing of a contaminated sharp that has not been correctly disposed of may be found in Box 5.

BOX 5: Safe Disposal of Sharps

What is the best way to remove a needle and syringe that has been disposed of incorrectly?

- **Put on a pair of gloves.**
- **Ideally, take a sharps container to the needle and syringe.**
- **NEVER re-cap a needle and syringe even if a cap is available.**
- **Use tongs, or similar implement, to pick up the needle and syringe. If no implement is available, carefully pick up the needle and syringe with the needle furthest away from your fingers and body.**
- **Carefully place the needle and syringe in the sharps container.**
- **Report the incident to your supervisor or manager.**

Recommendations:

35. 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.

36. Waste handlers must wear personal protective equipment appropriate to their risk. [All]

37. ***Non-immunized waste handlers must be offered hepatitis B immunization. [AII]***
38. ***Waste that is transported within a health care setting:***
    a. ***should be transported following clearly defined transport routes;***
    b. ***should not be transported through clean zones, public areas, or patient/resident care units;***
    c. ***should not be transported on the same elevator as clients/patients/residents or clean/sterile instruments/supplies; if a dedicated elevator is not available, transport waste at a different time from patients/residents or clean/sterile instruments/supplies; and***
    d. ***should be transported in leak-proof and covered carts which are cleaned on a regular basis. [BII]***
39. ***There shall be a system in place for the prevention of sharps injuries and the management of sharps injuries when they occur.***

5. Care and Storage of Cleaning Supplies and Utility Rooms

All chemical cleaning agents and disinfectants should be appropriately labelled and stored in a manner that eliminates risk of contamination, inhalation, skin contact or personal injury. Chemicals must be clearly labelled with Workplace Hazardous Materials Information System (WHMIS) information and an MSDS must be readily available for each item in case of accidents.[7]

An automated dispensing system should be used to ensure integrity of dilution ratios and to eliminate the need for decanting.[13] 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 for stability.

Equipment used to clean toilets (e.g., toilet brushes, toilet swabs) should not be carried from room-to-room. If feasible, the toilet brush may remain in the room; if not, consideration should be given to using disposable toilet swabs. Toilet cleaning and disinfecting equipment should be discarded when the patient/resident leaves or as required. In multibed rooms, a system should be developed for replacement of toilet brushes on a regular basis or as required. When choosing a tool for cleaning toilets, consideration should be given to equipment that will minimize splashing.

5.1 Housekeeping Rooms/Closets

Housekeeping rooms or closets are used by the staff who perform housekeeping duties in the health care setting. Sufficient housekeeping rooms/closets should be provided throughout the facility to maintain a clean and sanitary environment, with at least one per patient/resident floor.[92] In general, a housekeeping room or closet[13]:

a) is a dedicated room, not used for other purposes;
b) shall be maintained in accordance with good hygiene practices[24];
c) should have eye protection available;
d) should have an appropriate water supply and a sink/floor drain[92];
e) should be well ventilated;
f) should have suitable lighting;
g) should be easily accessible in relation to the area it serves;
h) should have locks fitted to all doors;
i) should be appropriately sized to the amount of materials, equipment, machinery and chemicals stored in the room/closet[92] and allow for proper ergonomic movement within the room/closet;
j) should never contain personal clothing or grooming supplies, food or beverages;
k) shall have chemical storage that ensures chemicals are not damaged and may be safely accessed;
l) should be free from clutter to facilitate cleaning; and
m) should be designed so that, whenever possible, buckets can be emptied without lifting them.

Cleaning equipment requires attention to avoid cross-transmission of microorganisms and proliferation of microorganisms in dirty environments:

a) tools and equipment used for cleaning and disinfection must be cleaned and dried between uses (e.g., mops, buckets, rags);
b) mop heads should be laundered daily; all washed mop heads must be dried thoroughly before storage;
c) cleaning equipment shall be well maintained, clean and in good repair;
d) cleaning carts:
    i. should have a separation between clean and soiled items;
    ii. should never contain personal clothing or grooming supplies, food or beverages;
    iii. should be thoroughly cleaned at the end of the day;
e) in long-term care homes, cleaning carts shall be equipped with a locked compartment for storage of hazardous substances and each cart shall be locked at all times when not attended.[23]

5.2 Soiled Utility Rooms/Workrooms

Each patient/resident care area should be equipped with a room that may be used to clean soiled patient/resident equipment that is not sent for central reprocessing (e.g., IV poles, commode chairs). A soiled utility room/workroom should:

a) be physically separate from other areas, including clean supply/storage areas;
b) be designed to minimize the distance from point-of-care;
c) have a work counter and clinical sink (or equivalent flushing-rim fixture) with a hot and cold mixing faucet[92];
d) have a dedicated hand washing sink with both hot and cold running water[92];
e) have adequate space to permit the use of equipment required for the disposal of waste;
f) have PPE available to protect staff during cleaning and disinfecting procedures; and
g) 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; however, facilities for cleaning bedpans must be provided elsewhere.[92] Soiled utility rooms/workrooms should not be used to store unused equipment.

5.3 Clean Supply Rooms

Each patient/resident care area should be equipped with a room/area that is used to store clean supplies and equipment. A clean supply room/area should:

a) be separate from soiled workrooms or soiled holding areas[92];
b) be able to keep supplies free from dust and moisture;
c) be adjacent to usage areas and easily available to staff;
d) be equipped with a work counter and dedicated hand washing sink if used for preparing patient care items.[92]

Recommendations:

40. ***Cleaning agents and disinfectants shall be labelled with WHMIS information.***
41. ***Cleaning agents and disinfectants shall be stored in a safe manner in storage rooms or closets.***
42. ***Automated dispensing systems, which are monitored regularly for accurate calibration, are preferred over manual dilution and mixing. [BIII]***
43. ***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]***
44. ***Equipment used to clean toilets:***
    a. ***should not be carried from room-to-room;***
    b. ***should be discarded when the patient/resident leaves and as required; and***
    c. ***should minimize splashing. [BIII]***

45. Sufficient housekeeping rooms/closets should be provided throughout the facility to maintain a clean and sanitary environment. [BIII]

46. Housekeeping rooms/closets:
   - ***a. should not be used for other purposes;***
   - ***b. shall be maintained in accordance with good hygiene practices;***
   - ***c. should have eye protection available;***
   - ***d. should have an appropriate water supply and a sink/floor drain;***
   - ***e. should be well ventilated and suitably lit;***
   - ***f. should have locks fitted to all doors;***
   - ***g. should be easily accessible to the area;***
   - ***h. should be appropriately sized to the equipment used in the room;***
   - ***i. should not contain personal supplies, food or beverages;***
   - ***j. shall have safe chemical storage and access;***
   - ***k. should be free from clutter; and***
   - ***l. should be ergonomically designed. [BII]***

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

48. Mop heads should be laundered daily and dried thoroughly before storage. [BIII]

49. 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]

50. Soiled utility rooms/workrooms should:
   - ***a. be readily available close to point-of-care in each patient/resident care area;***
   - ***b. be separate from clean supply/storage areas;***
   - ***c. contain a work counter and clinical sink;***
   - ***d. contain a dedicated hand washing sink;***
   - ***e. contain equipment required for the disposal of waste;***
   - ***f. contain personal protective equipment for staff protection during cleaning and disinfection procedures; and***
   - ***g. be sized adequately for the tasks required. [BII]***

51. Clean supply rooms/areas should:
   - ***a. be readily available in each patient/resident care area;***
   - ***b. be separate from soiled areas;***
   - ***c. protect supplies from dust and moisture;***
   - ***d. be easily available to staff; and***
   - ***e. contain a work counter and dedicated hand washing sink if used for preparing patient care items. [BII]***

6. Additional Considerations

6.1 Cleaning Food Preparation Areas

This Best Practices document does not address environmental cleaning required for facility kitchens, cafeterias or commercial food premises.

- Facilities should have policies and procedures that address the cleaning of food preparation areas that follow the requirements of the *Health Protection and Promotion Act*[115] dealing with food premises, available online at: http://www.e-laws.gov.on.ca/html/regs/english/elaws_regs_900562_e.htm.
- Long-term care homes must follow the requirements in applicable legislation and in the Long-Term Care Homes Program Manual,[23] available at: http://www.health.gov.on.ca/english/providers/pub/manuals/ltc_homes/ltc_homes_mn.html.

6.2 Construction and Containment

Construction activities generate dust and contaminants that may pose a risk to clients/patients/residents, staff or visitors in all health care settings. Infection Prevention and Control must assess construction and

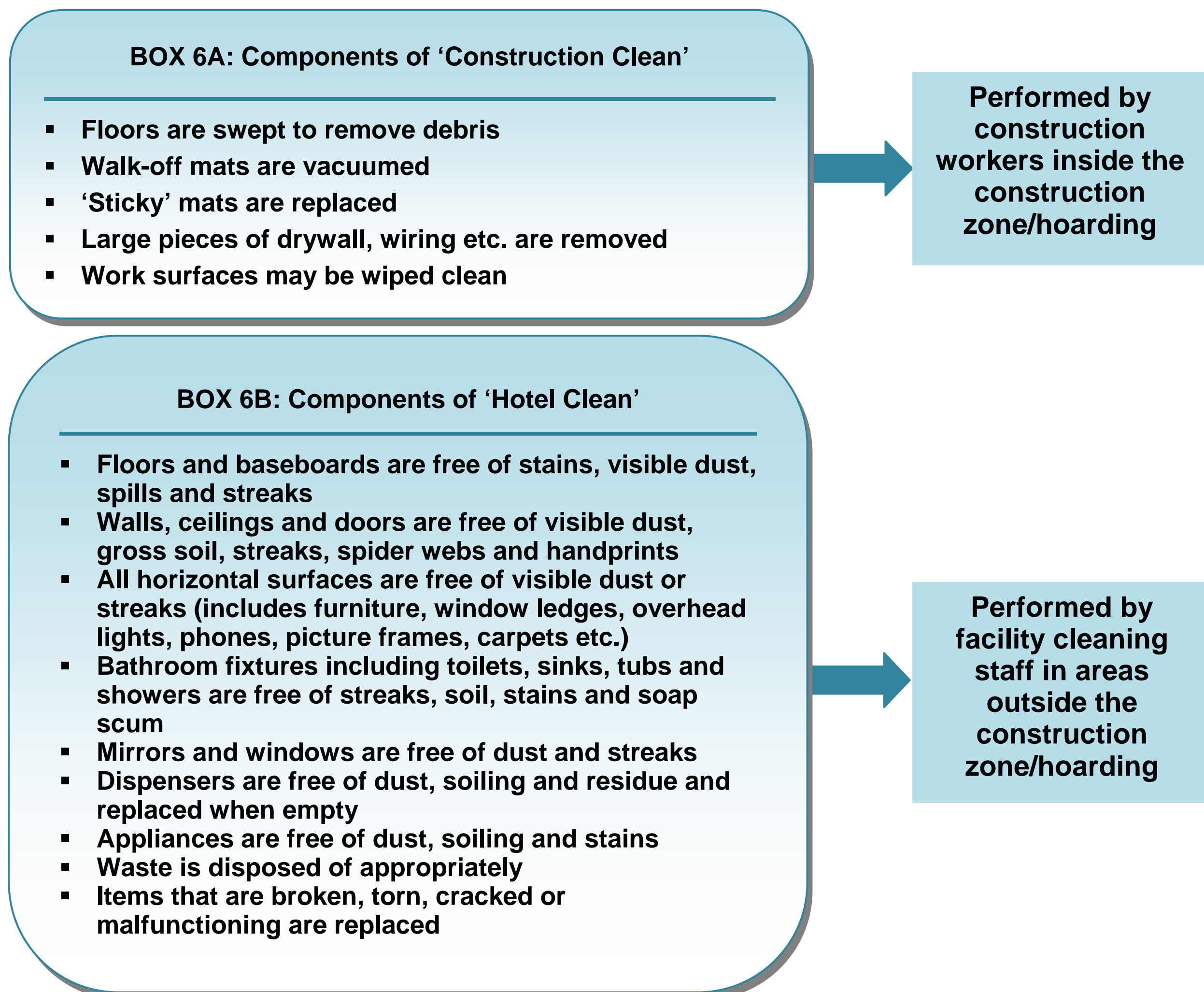
maintenance projects during planning, work, and after completion to verify that infection prevention and control recommendations are followed throughout the process.[18, 136] Where required, work must be performed under appropriately controlled conditions. Infection Prevention and Control and Occupational Health and Safety have the authority to halt projects if there is a safety risk.[18]

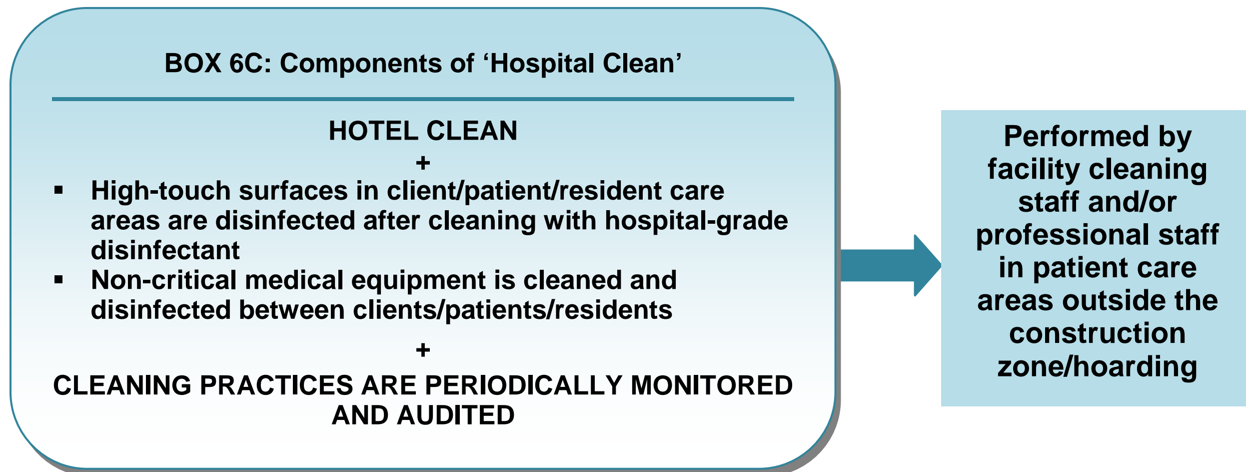
Cleaning is of particular importance both during construction and after completion of the construction project. What is considered to be 'clean' may be interpreted differently by contractors and hospital/health care staff:

> **'*Construction Clean*' is the level of cleaning performed by construction workers to remove gross soil, dust and dirt, construction materials and workplace hazards within the construction zone** (see Box 6).[4] This is done at the end of the day, or more frequently if needed, to avoid accumulation of dust. Hotel Clean and Hospital Clean begin where the construction site ends, i.e., outside the hoarding (see *Glossary*), and are generally done by the staff of the health care setting (see Section I for more information about Hotel Clean and Hospital Clean).

It is important that there is good liaison between the contractor, Environmental Services/Housekeeping, Infection Prevention and Control and Occupational Health and Safety. The level of cleaning that is expected during construction and at commissioning must be stated in the contract and the responsibility for cleaning both the job site and adjacent areas must be clearly defined. Where there is transport of construction materials (both clean and used materials) through the health care setting, a clear plan for traffic flow that bypasses care areas as much as possible must be established and adhered to.

Responsibility for Construction Clean and Hotel/Hospital Clean must be clearly defined within the health care setting:





For more information, refer to the following guidelines regarding infection prevention and control related to facility design in health care facilities:

- Refer to the American Institute of Architects: '*2006 Guidelines for Design and Construction of Health Care Facilities*'.[92]
- Refer to the Public Health Agency of Canada: '*Construction-related Nosocomial Infections in Patients in Health Care Facilities*',[137] available online at: http://www.phac-aspc.gc.ca/publicat/ccdr-rmtc/01vol27/27s2/index.html.
- Refer to the Canadian Standards Association: '*CAN/CSA-Z317.13-07 Infection Control During Construction, Renovation and Maintenance of Health Care Facilities*'.[136]

6.3 Environmental Cleaning Following Flooding

In the event of a flood (e.g., overflow from washing machine, dishwasher, toilet, sewer), the area must be immediately assessed by Infection Prevention and Control to determine the risk of contamination. Until confirmed as a clean water source, 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. For the longer term, the risk of mould from wet materials, drywall and furnishings must be taken into account[102] (e.g., if carpeting is still wet after 48 hours, the risk of mould increases and carpeting that remains wet after 72 hours must be removed[26]). If the flooding involves a food preparation area, all food products that have come into contact with flood water must be discarded and Public Health notified. Public Health must 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.

A sample procedure for dealing with a flood in a health care setting may be found in Box 7.

BOX 7: Steps to Take in the Event of a Flood (sample procedure)

- **Evacuate the area if required**
- **Contain the flood if possible**
- **Protect equipment with plastic sheeting or move if possible**
- **In long-term care homes, report the incident to the facility manager**
- **Infection Prevention and Control must be notified to assess the risk of contamination:**
  - **if water is contaminated with faecal material, the ICP will determine the need for PPE, hoarding, negative/positive pressure requirements, etc.**
  - **there must be proactive management of potential mould**
  - **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 all equipment and furniture before moving it from the flood area**

Adapted from Sunnybrook Health Sciences Centre's Emergency Response Plan Manual (last revision December 20, 2006)

6.4 New and Evolving Technologies

Infection Prevention and Control, Environmental Services and Occupational Health and Safety must be involved in all decision-making relating to changes in cleaning and disinfection methodologies and products.

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 must be carefully considered before use. Before considering a change from current methods for cleaning and disinfection in a health care setting, the newer product must be weighed against current products in terms of efficacy, ease of implementation, toxicity, effects on patient care, ergonomic considerations and cost implications. Infection Prevention and Control, Environmental Services and Occupational Health and Safety must be involved in all decision-making relating to changes in cleaning and disinfection methodologies and products in the health care setting.

A. Microfibres

Microfibres (MF) are densely constructed polyester and polyamide (nylon) fibres that are approximately 1/16 the thickness of a human hair.[138] 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. Microfibre materials are more absorbent than conventional cloths or cotton-loop mops, enabling them to hold six times their weight in water.[138] Microfibre materials can be wet with disinfectants.[139]

Ultramicrofibres (UMF) are thinner than regular MF and are woven from a continuous strand. They are designed to be used with low volumes of water containing neither detergent nor biocidal additives. Ultramicrofibre is used for cloths used in cleaning.

MF systems prevent transfer of microorganisms from room-to-room because a new microfibre pad or cloth is used in each room. Its increased absorbency means that a microfibre pad/cloth holds sufficient water for cleaning and at the same time it does not drip. Instead of repeatedly rinsing and wringing, soiled microfibre pads/cloths are replaced frequently with clean pads/cloths, then the soiled pads/cloths are washed in the laundry and re-used. There is no ‘double-dipping’ with MF products.

Microfibres may be damaged by fabric softeners, oils and grease, highly alkaline products such as bleach, some surfactants and high heat (washing temperature cannot exceed 93°C (200°F) and drying temperature cannot exceed 60°C (140°F).[140] The use of QUATs with many microfibre products is contraindicated. Manufacturer’s recommendations regarding compatability of products must be followed.

If a health care facility changes to MF mops and cloths, training is an essential part of the implementation.[140] The advantages and disadvantages of microfibre mops and cloths are presented in Box 8.

1. **Microfibre Mops**

   A microfibre mop consists of a synthetic pad fit on a plastic handle. Microfibre mop pads provide a cleaning surface 40 times greater than conventional string mops and increased absorbency. In a 2007 study,[140] a microfibre mop and bucket were compared with traditional mop and bucket system; the MF system demonstrated superior microbial removal compared to cotton string mops used with a detergent cleaner. The use of a disinfectant did not improve the microbial elimination demonstrated by the MF system, suggesting that a disinfectant is not required when using a microfibre mop for cleaning floors.

   Microfibre mops weigh less than conventional mops, reducing the physical effort required to clean floor surfaces.[141] The MF system cleans more effectively with a lesser amount of cleaning solution, reducing the overall effort needed to clean a floor and the time required for the floor to dry, minimizing slip hazards. Microfibre mops eliminate the need to empty large, heavy buckets of contaminated cleaning solution associated with the use of conventional string mops. They also eliminate the continual lifting of heavy mop heads into and out of the cleaning bucket. Use of microfibre mops has been shown to prevent injury and muscle strain generally associated with mopping tasks.

   - For more information about the benefits of microfibre mops and a comprehensive cost analysis, view the U.S. Environmental Protection Agency’s fact sheet,[138] available online at: http://www.ciwmb.ca.gov/wpie/healthcare/epamicromop.pdf.

2. **Microfibre and Ultramicrofibre Cloths**

   Microfibre cloths may be used either dry for dusting or wet for general-purpose cleaning. When used dry on a dry surface, MF cloths do not perform better than other types of materials at reducing bioburden or organic material,[142] but may be better for dusting due to its electrostatic properties. When wet, however, MF cloths remove significantly more soil than general-purpose cloths or paper towel and transfer significantly less organic debris than general-purpose cloths.[142]

   UMF cloths conform better to surfaces containing small abrasions invisible to the naked eye, in which bacteria might lodge and remain after passage of conventional cotton or wet loop cloths.[143] UMF cloths are particularly effective on older surfaces containing micro-fissures.[143] Some UMF cloths are designed to be used without disinfectants. **Product claims should be validated before use**.

In a recent study, Wren[143] et al demonstrated that UMF cloths were considerably more effective than wet loop cloths at removing MRSA, *Acinetobacter*, *K. oxytoca* and spores of *C.difficile* when moistened with water alone. UMF cloths were also significantly more effective in the presence of organic matter seeded onto surfaces prior to cleaning. In many cases, the use of UMF cloth resulted in total bacterial removal.

BOX 8: 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:

- **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**

B. Air Disinfection/Fogging

Disinfectant fogging techniques have been used in some countries for terminal 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. Newer gaseous formulations, such as vapourized hydrogen peroxide (VHP), super-oxidized water and ozone gas, appear to be effective agents in comparison to standard environmental cleaning for microorganisms such as *C. difficile* and MRSA.[64, 144-146] Disinfectant fogging is not appropriate for routine cleaning and should be restricted to terminal cleaning of isolation units and rooms involved in uncontrolled outbreaks.

1. Vapourized Hydrogen Peroxide (VHP)

Vapourized hydrogen peroxide (VHP) is effective against a wide range of microorganisms, including bacteria, viruses and spores, particularly those of *C. difficile*[145]. It has been used successfully in eradicating *Serratia marcescens* from neonatal intensive care units[147], MRSA from surgical units[64, 148, 149], VRE[150] and *C. difficile*.[145, 151, 152] VHP is relatively safe and decomposes to water and oxygen. The vapour 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 VHP into water and oxygen. The complete decontamination process takes an average of five hours.

A dry-mist hydrogen peroxide system has been used successfully in France to decrease *C. difficile* contamination by 91%, compared to a 50% reduction using sodium hypochlorite. Environmental cleaning with a detergent-disinfectant was performed prior to disinfection. The time required for the dry-mist decontamination was about 1.5 hours (dependant on room volume).[152]

In a study by French et al,[64] isolation rooms contaminated with MRSA were decontaminated more effectively with VHP than with routine cleaning measures. The vapour was particularly effective for decontaminating complex furniture and equipment that is difficult to clean manually. While the routine use of VHP is not advocated, use during outbreaks where other control measures have failed and where the environment is implicated in transmission may be warranted.

The advantages and disadvantages of VHP are presented in Box 9.

BOX 9: Advantages and Disadvantages of Vapourized Hydrogen Peroxide

Advantages:

- **more effective decontamination compared to routine cleaning**
- **reduced labour required**
- **by-products are safe for the environment**
- **useful for decontaminating soft furnishings and equipment that is difficult to clean**
- **may be used to decontaminate entire units/wards during outbreaks**

Disadvantages:

- **time-consuming (average five hours to complete for VHP)**
- **biological soiling reduces the efficacy of VHP**
- **air ducts from the room must be sealed prior to decontamination**
- **optimal methodology (including exposure time) is still under investigation**
- **expensive**

2. 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 (a surrogate for norovirus) from small rooms such as hotel rooms and cruise liner cabins[153] and to eliminate MRSA from the home of a health care provider with eczema.[154] The use of ozone gas as an antibacterial agent in recent studies shows promise for future use in health care settings.[144, 155] It is, however, 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.

The advantages and disadvantages of ozone gas are presented in Box 10.

BOX 10: 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 quickly (less than one hour for an entire room)**

Disadvantages:

- **toxic at high concentrations**
- **area to be decontaminated must be sealed off from other areas until ozone levels return to safe limits**

3. Super-oxidized Water

Super-oxidized water has hypochlorous acid as its principal ingredient, which is safe to use, is not harmful to the environment[146] and has a broad spectrum of activity that includes spores. Many formulations have a long shelf life and are safe for the environment.[156]

The use of super-oxidized water as a disinfectant fog shows promise,[146] but requires more study before applying it to the health care environment.

C. Ultraviolet Irradiation (UVI)

The use of ultraviolet irradiation (UVI) in the health care setting is limited to destruction of airborne organisms or inactivation of microorganisms on surfaces. UVI inactivates microorganisms at wavelengths of 240 to 280 nm.[139] Bacteria and viruses are more easily killed by UVI than are bacterial spores.

Germicidal effectiveness of UVI is influenced by[139, 157]:

a) amount and type of organic matter present;
b) wavelength of ultraviolet light;
c) air mixing and air velocity;
d) temperature and relative humidity;
e) type of microorganisms present; and
f) ultraviolet light intensity, which is affected by distance and cleanliness of lamp tubes.

If UVI is used in a health care 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.[158]

1. UVI Disinfection of the Air

Several studies have demonstrated that UVI is effective in killing or inactivating *M. tuberculosis* and in reducing the transmission of other infectious agents in hospitals. 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.[157] UVI is not a substitute for HEPA filtration in airborne infection isolation rooms.[157]

2. UVI Disinfection of Surfaces

UVI disinfection has been used successfully for final disinfection of isolation units once patients have been treated for infections.[159] 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.[159]

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. The advantages and disadvantages of UVI are presented in Box 11.

BOX 11: Advantages and Disadvantages of Ultraviolet Irradiation (UVI) of Surfaces

Advantages:

- **automated method – no manual labour is required**
- **relatively short exposure time required (40 minutes)**
- **no residue left following disinfection**

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**
- **disinfection does not occur in shadowed areas where the ultraviolet light cannot penetrate**
- **expensive**
- **rooms must be vacant during UVI disinfection and a warning sign must be posted**
- **staff should avoid entry during UVI disinfection**

D. 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.[160] Further study in clinical situations is needed.

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

E. 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.[26] There is no evidence to suggest that the use of these products will make individuals healthier or prevent disease.

In health care, there has been interest in treating surfaces around clients/patients/residents with materials that retard bacterial growth (e.g., stainless steel coated with titanium dioxide,[96] glass coated with xerogel,[97] surfaces brushed or sprayed with surfacine[161]). Treated surfaces and equipment have not been well studied in clinical settings and little data exists to show how these antimicrobial chemicals will endure after exposure to hospital-grade cleaners and disinfectants or whether they will prevent disease.

Recommendations:

52. ***Health care settings must 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]***
53. ***All health care settings must have a plan in place to deal with a flood. [AII]***
54. ***Infection Prevention and Control, Environmental Services and Occupational Health and Safety must be consulted before making any changes to cleaning and disinfection procedures and technologies in the health care setting. [BIII]***

7. Education

All aspects of environmental cleaning must be supervised and performed by knowledgeable, trained staff. Regular education and support must be provided by health care organizations and contract agencies to help staff consistently implement appropriate infection prevention and control practices. Infection prevention and control education should be provided at the initiation of employment as part of the orientation process and as ongoing continuing education.

ES must provide a training program which includes:

a) a written curriculum;
b) a mechanism for assessing proficiency;
c) documentation of training and proficiency verification; and
d) orientation and continuing education.

Education provided by ES should include:

a) handling of mops, cloths, cleaning equipment;
b) cleaning and disinfection of blood and body fluids;
c) handling and application of cleaning agents and disinfectants;
d) waste handling (general, biomedical, sharps)[132];
e) techniques for cleaning and/or disinfection of surfaces and items in the health care environment;
f) techniques for cleaning and disinfection of rooms under Additional Precautions; and
g) WHMIS training relating to the use of cleaning agents and disinfectants.[7]

Infection prevention and control education provided to staff working in ES departments should be given in collaboration with Infection Prevention and Control and Occupational Health and Safety and must include[18]:

a) the correct and consistent use of Routine Practices as a fundamental aspect of infection prevention and control in health care settings;

b) hand hygiene and basic personal hygiene, including the use of alcohol-based hand rubs and hand washing;
c) signage used to designate Additional Precautions in the health care setting;
d) the appropriate use of PPE including selection, safe application, removal and disposal; and
e) prevention of blood and body fluid exposure, including sharps safety.

Management and supervisory staff in ES departments should receive training and education that also includes:
a) chain of infection;
b) pest control; and
c) outbreak response.

It is recommended that managers and supervisors in ES departments attend, as a minimum, a certified course directly related to health care housekeeping and obtain certification within a recognized association:

- See the Ontario Health-Care Housekeepers' Association (OHHA) website for courses available in Ontario (website: http://www.ontariohealthcarehousekeepers.com/courses.htm).
- See the Canadian Association of Environmental Management (CAEM) website for certification program (website: http://www.caha1972.ca/certification.swf).

Recommendations:

55. All aspects of environmental cleaning must be supervised and performed by knowledgeable, trained staff. [BIII]
56. Environmental Services must provide a training program which includes:
   a. a written curriculum;
   b. a mechanism for assessing proficiency;
   c. documentation of training and proficiency verification; and
   d. orientation and continuing education. [BIII]
57. Infection prevention and control education provided to staff working in Environmental Services should be developed in collaboration with Infection Prevention and Control and Occupational Health and Safety and must include:
   a. the correct and consistent use of Routine Practices;
   b. hand hygiene and basic personal hygiene;
   c. signage used to designate Additional Precautions in the health care setting;
   d. the appropriate use of personal protective equipment (PPE); and
   e. prevention of blood and body fluid exposure, including sharps safety. [BIII]
58. Environmental Services managers and supervisors must receive training and be certified. [BIII]

8. Assessment of Cleanliness and Quality Control

> ***'If it can't be measured, it can't be improved'.***
> **Carling**

The Environmental Services department is responsible to ensure that the quality of cleaning maintained in the health care setting meets appropriate infection prevention and control 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 staff and management.

Monitoring should be an ongoing activity built into the routine cleaning regimen. Periodically, 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.[5]

Checklists and audit tools will assist supervisory staff in monitoring and documenting cleaning and disinfection. Feedback of results to ES staff has been shown to increase motivation and engagement with resulting improvements in cleaning scores.[55, 65]

Auditing the cleanliness of the health care 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. Audits should:

a) be measurable;
b) highlight areas of good performance;
c) facilitate positive feedback;
d) identify areas for improvement; and
e) provide a measurement that may be used as a quality indicator.

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

a) training new ES staff;
b) conducting cleaning audits; and
c) ensuring that cleaning expectations are clear for all staff.

There are several methods of evaluation available to determine if effective cleaning has taken place, including traditional observation of the environment following cleaning as well as newer technologies that show promise in assessing routine cleaning practices in health care settings:

a) direct and indirect observation (e.g., visual assessment, observation of performance, patient/resident satisfaction surveys);
b) residual bioburden (e.g., environmental culture, adenosine triphosphate – ATP – bioluminescence); and
c) environmental marking tools (e.g., fluorescent marking).

8.1 Measures of Cleanliness: Direct and Indirect Observation

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 clients/patients/residents based on their 'perceptions' of cleanliness. Neither of these methodologies have been standardized and quantification of results is difficult.

BOX 12A:
Direct and Indirect Observation
Answers the Question:
Does It 'Look' Clean?

- **Visual assessment**
- **Observation of performance**
- **Patient/resident satisfaction surveys**

A. Visual Assessment

Most generally accepted measures of cleanliness rely on visual assessment following cleaning as an indicator of cleanliness[12, 13, 121, 122], even though this has been shown to be an unreliable indicator to assess microbial contamination.[12, 123, 162, 163] 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.[5]

Visual assessment must be quantified in order to make it usable for auditing purposes. For example, in a study by Malik[5] et al, the following scoring system was used:

Scoring System for Visual Assessment

Quantification of Visual Assessment Techniques:	**Example – 25 items inspected:**	
Record a site as clean if dust, debris and soil are absent	**Clean**	**= 20 items**
Record a site as dirty if dust, debris or soil are present	**Dirty**	**= 5 items**
Calculate the cleaning rate as a percentage	**Cleaning Rate**	**= 80% of items**

The pass rate for visually clean surfaces will vary with the type of activity taking place in the area. For Hospital Clean, visual assessment should have a cleaning rate of 100%. For Hotel Clean, 80% is acceptable.

- Refer to Appendix C, '*Visual Assessment of Cleanliness*', for a sample scoring sheet.

B. 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.[55] 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.

Advantages of visual observation when performed using consistent criteria and feedback to staff include[55]:

a) ease of implementation and maintenance;
b) cost-effectiveness;
c) durability of results;
d) staff engagement; and
e) may reduce health care-associated infection rates over time.

Disadvantages of visual observation include:

a) difficulty in standardizing the methodology;
b) labour intensive; and
c) results might be impacted by the Hawthorne effect (*see Glossary*).

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 D, '*Sample Environmental Cleaning Checklists and Audit Tools*', for a sample audit tool for assessing cleaning performance.

C. Patient/Resident Satisfaction Surveys

The results of '*Patient/Resident 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.[122] One study found that patients' perceptions of cleanliness have been found to significantly correlate with rates of MRSA bacteraemia.[164]

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

clients/patients/residents on the same unit, then compare percentage of positive responses to those of previous years).

8.2 Measures of Cleanliness: Residual Bioburden

Microbiologically clean surfaces are those with a microbial load that is at an acceptable level[5] (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.[123, 165, 166]

BOX 12B: Residual Bioburden
Answers the Question:
Are Microorganisms Still Present?

- **Environmental culture**
- **ATP bioluminescence**

A. Environmental Culture

Routine environmental cultures in health care settings are neither cost-effective nor generally recommended.[26] The presence of a particular microorganism on an environmental surface does not confirm it as the cause of a client/patient/resident infection, even if it is the same strain. Decisions to conduct environmental sampling must be made in collaboration with the Microbiology laboratory.

If conducting environmental microbiologic sampling, the following recommendations should be considered[167]:

a) do not conduct random, undirected microbiologic sampling of air, water and environmental surfaces in health care facilities;
b) 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; and
c) limit microbiologic sampling for quality assurance purposes to biological monitoring of sterilization processes; monthly cultures of water and dialysate in haemodialysis units; and short-term evaluation of the impact of infection prevention and control measures or changes in infection prevention and control protocols.

B. 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 still 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). Benchmark values of 250 RLU[165] to 500 RLU[123, 162] have been proposed. Additional studies from multiple health care settings are needed before a standardized ATP bioluminescence breakpoint can be established for defining surfaces as adequately cleaned.[166]

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 may also be used for the evaluation of novel cleaning methods such as steam cleaning and microfibre cloths.[165]

8.3 Measures of Cleanliness: Environmental Marking

Environmental marking measures the thoroughness of cleaning using a surrogate marking system. It involves the use of a colourless solution that is applied to objects and surfaces in the client/patient/resident environment prior to cleaning, followed by detection of residual marker (if any) immediately after cleaning, usually involving fluorescence under ultraviolet (UV) light.[65, 168-171]

BOX 12C: Environmental Marking
Answers the Question:
Was Anything Missed?

- **Environmental marking tools**

Solutions used as markers must 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. The marker solution is applied to high-touch surfaces in patient/resident rooms prior to cleaning, then evaluated to see if the solution was removed by the cleaning. Environmental marking may be used either on a daily basis to assess routine cleaning,[168] or prior to discharge to assess terminal cleaning.[65, 169, 170]

This methodology may be quantified:

a) by calculating the percentage of marked objects/surfaces that were cleaned in a particular room or area[65, 169, 170]; or
b) by deriving a cleaning score (e.g., 3 = heavy fluorescence, 2 = moderate fluorescence, 1 = light fluorescence, 0 = no fluorescence).[168]

Recommendations:

59. There should be a process in place to measure the quality of cleaning in the health care setting. [BII]
60. Methods of auditing should include both visual assessment and at least one of the following tools: residual bioburden or environmental marking. [BII]
61. Results of cleaning audits should be collated and analysed with feedback to staff, and an action plan developed to identify and correct deficiencies. [BIII]

9. Occupational Health and Safety Issues Related to Environmental Services

ES staff are exposed to chemical agents and may be exposed to the same infectious agents in the workplace as are health 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 housekeeping activities, such as pushing, pulling, lifting and twisting.

Occupational health and safety issues include staff immunization, appropriate use of PPE, staff exposures to blood and body fluids and other infection hazards, work restrictions and staff safety issues.

9.1 Immunization

ES staff must be offered appropriate immunizations. Immunizations should be based on the Ontario Hospital Association/Ontario Medical Association's '*Communicable Diseases Surveillance Protocols*'[172-178] and the National Advisory Committee on Immunization recommendations for health care providers.[179] Appropriate immunization protects staff, colleagues and the client/patient/resident.

Immunizations appropriate for staff in health care include:

a) annual influenza vaccine[172];
b) measles,[173] mumps,[174] rubella[175] (MMR) vaccine;
c) varicella vaccine[176];

d) up-to-date tetanus vaccine[179];
e) hepatitis B vaccine[177] for staff who use sharps or who may be exposed to contaminated sharps; and
f) acellular pertussis vaccine.[178]

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

9.2 Personal Protective Equipment (PPE)

- See Section II - 1.1.D for information about PPE.

9.3 Staff Exposures

There must 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) a sharps injury prevention program[18];
b) timely post-exposure follow-up and prophylaxis when indicated[18, 132, 177];
c) a respiratory protection program if staff are entering an airborne infection isolation room housing a TB patient; and
d) review and reporting of exposures to both Infection Prevention and Control and Occupational Health and Safety.

9.4 Work Restrictions

All health care settings should establish a clear expectation that staff do not come into work when acutely ill with a probable infection (e.g., fever, cough, 'common cold', 'flu-like' symptoms, diarrhea, vomiting, rash and/or conjunctivitis) and support this expectation with appropriate attendance management policies.[18, 180] Staff carrying on activities in a health care setting who develop a communicable disease may be subject to work restrictions.[181]

9.5 Other Considerations

A. Chemical Safety

ES workers have potential exposures to chemicals and, in some circumstances, may develop symptoms related to these exposures. Typically the exposures are either through inhalation (respiratory) or dermal (skin) exposure. There are a number of factors that contribute to symptoms, including previous history of allergy, eczema or asthma; and there are factors that help minimize potential exposure, such as use of engineering controls (e.g., good ventilation) and use of personal protective equipment (e.g., proper glove choice).

Chemicals can function as irritants (e.g., sodium hypochlorite) or sensitizers (e.g., quaternary ammonium compounds) and can result in respiratory symptoms or dermatitis. Respiratory symptoms may include cough or wheeze. An irritant may exacerbate symptoms of underlying asthma. Over time, without adequate controls, a sensitizer may cause asthma.

Irritants in health care settings associated with skin symptoms (irritant contact dermatitis) include water, soaps and detergents, most frequently in those who have underlying atopic dermatitis (allergy, eczema). Symptoms (dryness, cracking, eczema) are usually worsened during winter months. A smaller number of people will develop allergic contact dermatitis where a particular allergen can cause an inflammatory response, usually hours to days later, which clinically may appear similar to irritant contact dermatitis.

Do not apply cleaning chemicals by aerosol or trigger sprays.

It is important that any health care worker who has a significant allergic or asthmatic or dermatitis history, or who develops symptoms that may be related

to work exposures, be assessed by Occupational Health and Safety. 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.[13]

Chemicals must be stored and handled appropriately. Health care settings shall have in place written policies and procedures in accordance with the Workplace Hazardous Materials Information System (WHMIS).[132] All cleaning staff shall receive WHMIS training[7] and know the location of the MSDS for each of the cleaning and disinfecting agents they use. 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 online from Health Canada website at: http://www.hc-sc.gc.ca/ewh-semt/occup-travail/whmis-simdut/index_e.html.

B. Ergonomic Considerations

Selection of housekeeping cleaning equipment must 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 have proper handle length help reduce the risk of injury.

- For more information about ergonomic design related to environmental cleaning, visit the Ontario Safety Association for Community and Healthcare's website at: http://www.osach.ca/new/SaftInfo/MSD.shtml.

Recommendations:

62. ***Environmental Services staff must be offered appropriate immunizations. [AII]***
63. ***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 airborne infection isolation room accommodating a patient with tuberculosis.***
64. ***There must 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]***
65. ***There must be procedures for the evaluation of staff who experience sensitivity or irritancy to chemicals. [AII]***
66. ***Aerosol or trigger sprays for cleaning chemicals should not be used. [BIII]***
67. ***Selection of housekeeping cleaning equipment must follow ergonomic principles. [AII]***

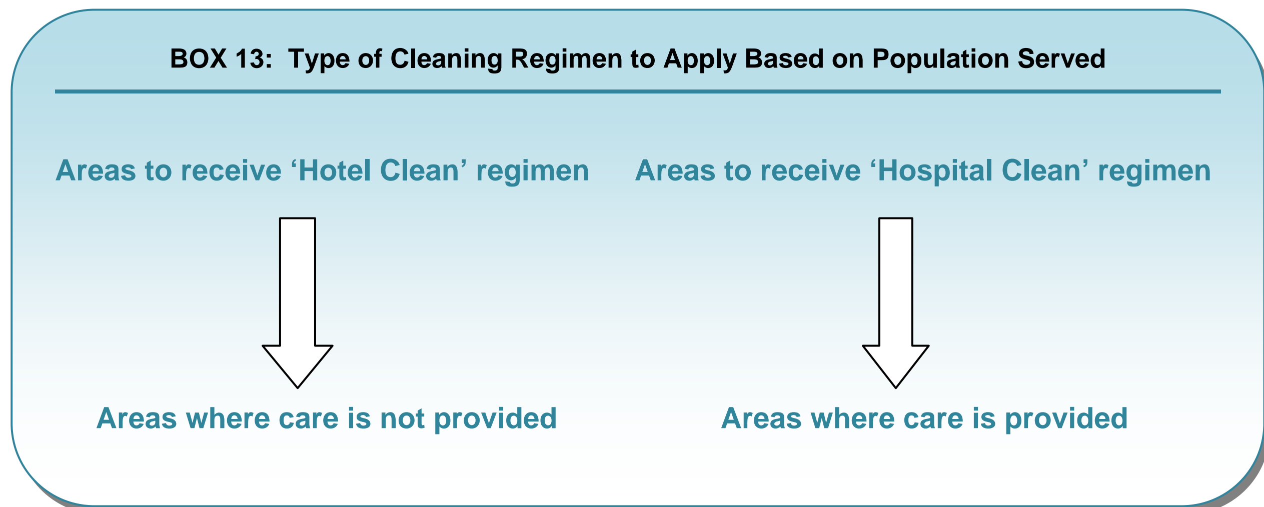
III. Cleaning and Disinfection Practices for all Health Care Settings

The goal of cleaning is to keep the environment safe for clients/patients/residents, staff and visitors. The objective of cleaning efforts should be to keep surfaces visibly clean, to disinfect high-touch surfaces more frequently than low-touch surfaces and to clean up spills promptly.[62] Cleaning procedures must be effective and consistent to prevent the build up of soil, dust and debris than can harbour microorganisms and support their growth. Effective cleaning practices incorporate the principles of infection prevention and control into the risk stratification, cleaning methodology and cleaning frequency.

1. Routine Health Care Cleaning Practices

1.1 General Cleaning Practices

Health care settings are comprised of areas that require either Hotel Clean or Hospital Clean based on the risk of the patient/resident population in the area, as indicated in Box 13:



The key to effective cleaning and disinfection of environmental surfaces is the use of friction ('*elbow grease*') to remove microorganisms and debris. Surfaces must be cleaned of visible soil before being disinfected, as organic material may inactivate a disinfectant. General practices to be followed in all health care settings for all cleaning are listed in Box 14.

BOX 14: General Cleaning Practices for All Health Care Settings

Before Cleaning:

- check for Additional Precautions signs; follow precautions indicated
- remove clutter before cleaning
- follow the manufacturer's instructions for proper dilution and contact time for cleaning and disinfecting solutions
- gather materials required for cleaning before entering the room
- clean hands on entering the room

During Cleaning:

- progress from the least soiled areas (low-touch) to the most soiled areas (high-touch) and from high surfaces to low surfaces
- remove gross 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
- no '*double-dipping*' of cloths
- change cloths/mop heads frequently
- change cleaning solutions as per manufacturer's instructions; 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 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)
- clean hands on leaving the room

After Cleaning:

- do not overstock rooms
- tools used for cleaning and disinfecting must be cleaned and dried between uses
- launder mop heads daily; all washed mop heads must be dried thoroughly before re-use
- clean housekeeping cart and carts used to transport waste daily

1.2 Cleaning Methods

A. Patient/Resident Room Cleaning

1. Daily Routine Patient/Resident Room Cleaning

Hospital Clean of patient/resident rooms should follow a methodical, planned format that includes the following elements:

a) assessment – walk through room to determine what needs to be replaced (e.g., toilet paper, paper towels, soap, ABHR, gloves, sharps container) and whether any special materials are required; this may be done before or during the cleaning process;
b) assembly of supplies – gather all required supplies before starting to clean the room;
c) hand hygiene – perform hand hygiene on entering the room and before putting on gloves;
d) cleaning and disinfection – work from clean to dirty and from high to low areas of the room;
e) disposal – collect waste;
f) remove gloves and perform hand hygiene on leaving the room; and
g) replace clean supplies as required and clean hands on leaving the room.

Hospital Clean includes a monitoring/auditing component, and this should be done by a supervisor following the cleaning procedure.

➢ See Box 15 for a sample procedure for routine daily cleaning of a patient/resident room.

2. Scheduled Patient/Resident Room Cleaning

In addition to routine daily cleaning of patient/resident rooms, additional cleaning should be scheduled:

a) waste emptied at least twice daily;
b) high dusting (see below) in room at least weekly;
c) baseboard and corners cleaned at least weekly;
d) clean window curtains/coverings when soiled and at least annually; and
e) dust window blinds at least monthly.

In long-term care homes, this additional cleaning should occur weekly.

➢ Refer to Appendix G, '*Recommended Minimum Cleaning and Disinfection Level and Frequency for Non-critical Client/Patient/Resident Care Equipment and Environmental Items*' for suggested cleaning levels and frequencies.

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

a) use HEPA-filtered vacuums or chemically treated damp mop/dusters;
b) proceed either clockwise or counter clockwise from the starting point, to avoid missing any surfaces; and
c) note and report stained or misplaced ceiling tiles, fixtures or walls so they can be replaced or repaired.

BOX 15: Sample Procedure for Routine Daily Cleaning of Patient/Resident Room (does not include rooms on Additional Precautions)

1. **Assessment**
   - Check for Additional Precautions signs and follow the precautions indicated (**see Additional Precautions cleaning procedures**)
   - 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 cloths is available
   - Prepare fresh disinfectant solution according to manufacturer's instructions

3. **Clean hands using ABHR and put on gloves**

4. **Clean room, working from clean to dirty and high to low areas of the room:**
   - Use fresh cloth(s) for cleaning each patient/resident 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 and after cleaning heavily soiled areas such as toilet and bedpan cleaner
     - if there is more than one patient/resident bed space in the room, use fresh cloth(s) for each and complete the cleaning in each bed space before moving to the next
   - 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
   - Check privacy curtains for visible soiling and replace if required
   - 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. 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 (**see bathroom cleaning procedure**)
   - Clean floors (**see floor cleaning procedure**)

5. **Disposal**
   - Place soiled cloths in designated container for laundering
   - Check sharps container and change when ¾ full (do not dust the top of a sharps container)
   - Remove soiled linen if bag is full
   - Place obvious waste in receptacles
   - Remove waste

6. Remove gloves and clean hands with ABHR; if hands are visibly soiled, wash with soap and water; **DO NOT LEAVE ROOM WEARING SOILED GLOVES**

7. **Replenish** supplies as required (e.g., gloves, ABHR, soap, paper towel)

8. **Clean hands** with ABHR

3. Terminal/Discharge Patient/Resident Room Cleaning

When a patient/resident is discharged, transferred or dies, the room or bed space must be cleaned and disinfected thoroughly before the next patient/resident occupies the space. Responsibilities of health care providers include:

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

Shared personal care items can result in transmission of microorganisms to other clients/patients/residents and health care providers. The importance of ensuring that personal care items are not shared and are kept clean contributes to patients/residents' safety and well-being.[182] When the individual is discharged or transferred, their personal items become part of the terminal/discharge clean and should be taken with them or discarded.

Personal care items include:

- lotions and creams
- soaps
- razors
- toothbrush, toothpaste, denture box
- comb and hairbrush
- nail care equipment
- books, magazines (discard)
- toys

Once health care providers have completed their tasks, terminal/discharge cleaning may take place by ES.

➢ See Box 16 for a sample procedure for terminal/discharge cleaning of a patient/resident room.

BOX 16: Sample Procedure for Routine Terminal/Discharge Cleaning of a Patient/Resident Room (does not include rooms on Additional Precautions)

1. **Assessment**
   - Check for Additional Precautions signs and follow the precautions indicated (**see Additional Precautions cleaning procedures**)
   - 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 cloths is available
   - Prepare fresh disinfectant solution according to manufacturer's instructions
3. **Clean hands using ABHR and put on gloves**
4. **Remove dirty linen:**
   - Strip the bed, discarding linen into soiled linen bag; roll sheets carefully to prevent aerosols
   - Inspect bedside curtains and window treatments; if visibly soiled, clean or change
   - Remove gloves and clean hands
5. **Apply clean gloves and clean room, working from <u>clean to dirty</u> and from <u>high to low</u> areas of the room:**
   - Use fresh cloth(s) for cleaning <u>each</u> patient/resident bed space:
     - if a bucket is used, do not 'double-dip' cloth(s) back into cleaning solution once used
     - change the cleaning cloth when it is no longer saturated with disinfectant and after cleaning heavily soiled areas such as toilet and bedpan cleaner
     - if there is more than one patient/resident bed space in the room, use fresh cloth(s) for each and complete the cleaning in each bed space before moving to the next
   - 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 with glass cleaner
   - Check privacy curtains for visible soiling and replace if required; in long-term care, change curtain
   - 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. Pay particular attention to high-touch surfaces
   - Clean equipment (e.g., IV pole and pump, walkers, wheelchairs)
   - Clean inside and outside of patient/resident cupboard or locker
6. **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
   - 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
7. **Clean bathroom/shower (see bathroom cleaning procedure)**
8. **Clean floors (see floor cleaning procedure)**
9. **Disposal**
   - Place soiled cloths in designated container for laundering
   - Check sharps container and change when ¾ full (do not dust the top of a sharps container)
   - Remove soiled linen bag and replace with fresh bag
   - Place obvious waste in receptacles
   - Close waste bags and remove; clean waste can/holder if soiled and add a clean bag
10. **Remove gloves and clean hands** with ABHR; if hands are visibly soiled, wash with soap and water; **DO NOT LEAVE ROOM WEARING SOILED GLOVES**
11. **Remake** bed and **Replenish** supplies as required (e.g., gloves, ABHR, soap, paper towel, toilet brush)
12. Return cleaned equipment (e.g., IV poles and pumps, walkers, commodes) to clean storage area

B. Bathroom Cleaning

Bathrooms should be cleaned last, after completing the room. Shower walls should be thoroughly scrubbed at least weekly. Shower curtains should be changed at least monthly and as required.

Bathrooms require a Hospital Clean regimen, including periodic monitoring/auditing.

Emergency room/urgent care centre bathrooms are located in high traffic areas and may frequently become contaminated, particularly with *C. difficile* and enteric viruses such as norovirus. At a minimum, emergency room bathrooms should:

a) be cleaned and disinfected at least every four hours;
b) preferably be disinfected with a sporicidal agent;
c) be frequently inspected and re-cleaned if necessary; and
d) be cleaned more frequently based on need.

Bathrooms require Hospital Clean, which includes a periodic monitoring/auditing component, and this should be done by a supervisor following the cleaning procedure.

- See Box 17 for a sample procedure for cleaning patient/resident bathrooms.

BOX 17: Sample Procedure for Routine Bathroom Cleaning

NOTE: Bathrooms require Hospital Clean

Working from clean areas to dirty areas:

- Remove soiled linen from floor; wipe up any spills; remove waste
- 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; apply disinfectant to interior of sink; ensure sufficient contact time with disinfectant; rinse sink and dry fixtures
- Clean all dispensers and frames
- Clean call bell and cord
- Clean support railings, ledges/shelves
- Clean shower/tub faucets, walls and railing, scrubbing as required to remove soap scum; inspect grout for mould; apply disinfectant to interior surfaces of shower/tub, including soap dish, faucets and shower head; ensure sufficient contact time for disinfectant; rinse and wipe dry; inspect and replace shower curtains monthly and as required
- Clean bedpan support, entire toilet including handle and underside of flush rim; ensure sufficient contact time with disinfectant
- Remove gloves and wash hands
- Replenish paper towel, toilet paper, waste bag, soap and ABHR as required
- Report mould and cracked, leaking or damaged areas for repair

Additionally for terminal/discharge cleaning:

- Change all waste bags, clean waste can if dirty
- Scrub shower walls

C. Floor Cleaning

Floors in health care settings may be comprised of a number of materials, depending on the location of the flooring and the client/patient/resident population in the vicinity. It is important to review the manufacturer's recommendations for cleaning a particular type of flooring before developing cleaning protocols.

- See Section I - 3.2 for information about floor finishes in health care.
- See Section I - 3.4 for information about carpeting in health care.

1. Floor Care

Floor cleaning consists of dry dust mopping to remove dust and debris, followed by wet mopping with a detergent to clean. The issue of whether or not to use a disinfectant in the routine mopping of floors in health care settings is unresolved.[105, 183-186] Under normal circumstances, the use of a disinfectant is not required.

There are currently two methods for wet mopping floors:

a) bucket and loop mop (traditional method); and
b) microfibre mop (see Section II - 6.4.A for more information about microfibre cleaning products).

- See Boxes 18 to 20 for sample procedures for mopping.

BOX 18: Sample Procedure for Mopping Floors using Dry Dust Mop

Working from clean areas to dirty areas:

- Remove debris from floor and dry any wet spots
- Remove gum or other sticky residue from floor
- 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

BOX 19: Sample Procedure for Mopping Floors using Wet Loop Mop and Bucket

Working from clean areas to dirty areas:

- Prepare fresh cleaning solution according to the manufacturer's instructions using appropriate PPE according to 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 when heavily soiled and at the end of the day
- Change cleaning solution frequently enough to maintain appropriate concentration of solution (e.g., every four patient/resident rooms and when heavily soiled)

BOX 20: Sample Procedure for Mopping Floors using a Microfibre Mop

Working from clean areas to dirty areas:

- 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
- Send soiled microfibre pads for laundering at the end of the day

2. Carpet Care

- See Section I - 3.4 for general information about carpeting in health care settings.

If carpeting is used in patient care areas of hospitals, it must include a rigorous program of care that includes:

a) daily vacuuming with a HEPA-filtered vacuum;
b) scheduled extraction/shampooing; and
c) rapid response for dealing with spills of blood and body fluids.

Recommendations for the care of carpeting in general areas should include[26]:

a) vacuuming with a HEPA-filtered vacuum;
b) diffusion of the expelled air from vacuum cleaners so that it does not aerosolize dust from uncleaned surfaces; and
c) a method for routine cleaning and extraction/shampooing (see Table 3).

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).

Table 3: 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 method
Dry Extraction	Premoistened 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	▪ low moisture ▪ rapid drying ▪ very effective in	▪ detergent is difficult to remove, contributing to rapid re-soiling

Method	Process	Advantages	Disadvantages
	soil are then removed using the machine's extraction system (if built-in) or a wet/dry vacuum.	removing dust mite and mould allergens ▪ cleaning results are excellent	
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
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

[Adapted from '*The Carpet Buyers Handbook*', 2008[187]]

D. Equipment and Specialized Item Cleaning

1. Non-critical Client/Patient/Resident Equipment

Non-critical equipment in health care settings should be cleaned with a detergent or a low-level cleaner/disinfectant. The manufacturer's recommended contact time for the product being used must be closely followed.

➢ Refer to Appendix G, '*Recommended Minimum Cleaning and Disinfection Level and Frequency for Non-critical Client/Patient/Resident Care Equipment and Environmental Items*' for suggested level of decontamination and frequency.

2. Electronic Equipment

Electronic equipment in the health care 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 health care provider burns. Equipment malfunctions could result in life-threatening events to patients such as over-infusion of medications and loss of life-supporting interventions.[188]

To avoid hazards:

a) obtain the manufacturer's labelling which may include instructions for cleaning and disinfection; information may be available on the manufacturer's website;
b) review labelling for any cautions, precautions, or warnings about wetting, immersing, or soaking the equipment;
c) review the manufacturer's cleaning and maintenance instructions and ensure all staff who will be cleaning the item are trained;
d) protect equipment from contamination whenever possible:
    i. position equipment to avoid contact with anticipated spatter;
    ii. avoid laying contaminated items on unprotected equipment surfaces;
    iii. use barriers on equipment surfaces that you expect to touch with contaminated hands or when contact with spatter cannot be avoided (e.g., keyboard skins); and
e) 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.

3. Ice Machines

Bacteria have been isolated from ice, ice-storage chests and ice-making machines.[189, 190] 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 preferred. If older machines are in use, a scoop should be provided 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. 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 Box 21 for a sample procedure for cleaning ice machines.

BOX 21: Sample Procedure for Cleaning Ice Machines

Daily:

- Visually inspect ice machines daily and report any signs of mould
- Replace ice scoop daily and send for cleaning
- 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)
- 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.

4. Playrooms/Toys

Toys can be a reservoir for potentially pathogenic microorganisms that can be present in saliva, respiratory secretions, faeces or other body substances.[52, 191-194] Outbreaks associated with toys have been described.[34] Toys should:

a) be nonporous and able to withstand rigorous mechanical cleaning;
b) plush toys should be dedicated to individual patients and be sent home or discarded when the patient is discharged;
c) not be used if water retaining;
d) not have parts that cannot be cleaned; and
e) not be cleaned with phenolics.

If toys cannot be cleaned, they should be discarded.

Responsibility for cleaning toys should be assigned (e.g., paediatric ES staff, Child Life staff) and written procedures regarding frequency and methods of cleaning are required. Staff assigned to clean toys must be trained in effective cleaning procedures.

- See Box 22 for a sample cleaning procedure for toys.

BOX 22: Sample Procedure for Cleaning Toys

After each use, clean, disinfect and rinse thoroughly:

- toys that may be 'mouthed' (e.g., infant and toddler toys)

Daily clean with detergent and approved 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:

- Clean toy storage bins/boxes/cupboards/ shelves
- Clean all surfaces of playhouses/climbers

Adapted from CHICA-Canada's '*Toys Position Statement*'

5. Cloth Furnishings

Upholstery and cloth furnishings should be vacuumed regularly or steam cleaned as necessary when stained or visibly soiled.[3] Refer to the manufacturer's recommendations for cleaning upholstered furnishings. There should be a plan in place to replace cloth furnishings with cleanable furnishings on a continuous basis. Replace cloth furnishings that are torn or damaged.

6. Hydrotherapy Equipment

Hot tubs, whirlpools, spas and physiotherapy pools have been associated with the acquisition of infection.[195-197] Skin and wound infections may result from direct contact of intact skin or wounds to contaminated water. Inhalation of microorganisms in aerosolized water has resulted in respiratory infections (e.g., whirlpools).

Cleaning of hydrotherapy equipment must 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.

7. Transport Equipment

In acute care, transport equipment (e.g., stretchers, wheelchairs) should be disinfected with a hospital-grade disinfectant immediately after use.[198, 199] Attention should be paid to high-touch areas (e.g., rails, push handles, chair arms). If transport equipment is covered with a protective sheet, the need for cleaning will be reduced unless visible soiling has occurred. In addition, all transport equipment should be cleaned routinely following a written schedule. Responsibility for cleaning transport equipment must be clearly designated (e.g., transport staff, ES staff).

In long-term care, equipment used to transport residents within the facility (e.g., personal walkers, wheelchairs) must be immediately cleaned when soiled or visibly contaminated with blood or body fluids, as well as routinely following a written schedule.

Ambulances should be cleaned, disinfected and restocked after each patient transport and a thorough cleaning should also be completed when required due to heavy contamination and on

a regular, scheduled basis.[200] A sample cleaning protocol for ambulances may be found in Box 23.

BOX 23: Sample Procedure for Cleaning an Ambulance

Routine Clean Following Each Transport:

- Place biomedical waste (e.g., dressings, bandages, contaminated sheets that are saturated with blood) in a clearly marked biohazardous waste receptacle
- Carefully dispose of sharps that are found during cleaning in appropriate sharps container
- Remove used linens/blankets for laundering
- Clean and disinfect/sterilize equipment used during the call
- Clean and disinfect the cab and patient compartment as required
- If the vehicle is heavily contaminated it will be taken out of service and deep cleaned
- Restock vehicle as required

Deep Clean as Required and When Scheduled:

Driver's Compartment
- Remove all equipment from the front of the vehicle
- Clean and vacuum floor
- Clean and disinfect all interior surfaces, including walls, doors, radio equipment, dash and windows

Patient Compartment
- Remove stretchers, clean and disinfect including mattress and belts; check for wear or damage
- Remove wall suction, clean and disinfect
- Remove contents of cupboards and shelves; clean and disinfect all surfaces
- Clean, disinfect and dry all hard surface items before returning to cupboard or shelf; inspect for damage and expiration dates; repair/replace as needed
- Sweep, vacuum, clean and disinfect floor
- Clean and disinfect chairs, bench seats, seat belts
- Clean and disinfect all interior surfaces, including ceiling and walls
- Remove scuff marks
- Check interior lighting
- Empty, clean and disinfect waste containers
- Clean interior windows

Equipment Storage Compartment
- Remove all equipment and sweep out compartment
- Clean and disinfect compartment and restock

Adapted from: Ministry of Health and Long-Term Care, Emergency Health Services Branch's '*Infection Prevention and Control Best Practices Manual for Land Ambulance Paramedics*', Version 1.0 (March 2007); Greater Sudbury Emergency Medical Services '*Vehicle and Equipment Policy and Procedure Manual*', Section 4 (revised August 2006); and Algoma Emergency Medical Services, Standardized Vehicle Deep Clean Procedure.

E. Surgical/Sterile Settings

1. Operating Rooms

Environmental cleaning in surgical settings minimizes patients' and health care 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[201]:

a) the ultimate responsibility for ensuring a clean surgical environment rests with the perioperative Registered Nurse;
b) environmental cleaning must be performed by trained staff according to the protocol of the health care setting; and
c) a regular cleaning schedule must be established, posted and documented.

Responsibility for cleaning anaesthetic machines and carts should be clearly defined.

The sample protocols for routine cleaning in Boxes 24 and 25 are based on ORNAC standards.

BOX 24: Sample Procedure for Cleaning Operating Rooms Between Cases

- Prepare fresh disinfectant solution according to manufacturer's instructions
- Clean hands and put on gloves
- Collect and remove waste
- Collect and remove all soiled linen
- Remove gloves and clean hands
- Use a cloth dampened in disinfectant solution to clean and disinfect horizontal surfaces that have come in contact with a patient or body fluids, including blood pressure cuffs, tourniquets and leads
- Clean suction canisters
- Clean and disinfect bed
- 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
- 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
- Remove gloves and clean hands

Adapted from the Operating Room Nurses Association of Canada (ORNAC) Recommended Standards, Guidelines and Position Statements for Perioperative Registered Nursing Practice. Module 2, Infection Prevention and Control; Section 3: Environmental Cleaning/Sanitation. 2006.

BOX 25: Sample Procedure for Terminal Cleaning Operating Rooms (End of Day)

- Prepare fresh disinfectant solution according to manufacturer's instructions
- Clean hands and put on gloves
- Collect and remove waste
- Collect and remove all soiled linen
- Clean hands and change gloves
- Clean and disinfect lights and ceiling tracks
- Clean and disinfect all door handles, push plates, light switches and controls
- Clean and disinfect telephones and computer keyboards
- Spot wash all walls
- Clean and disinfect all exterior surfaces of machines and equipment (e.g., anaesthesia carts)
- 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 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
- 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

Adapted from the Operating Room Nurses Association of Canada (ORNAC) Recommended Standards, Guidelines and Position Statements for Perioperative Registered Nursing Practice. Module 2, Infection Prevention and Control; Section 3: Environmental Cleaning/Sanitation. 2006.

Additional cleaning should be performed on a scheduled basis. See Table 4 for a sample schedule for additional cleaning of items in operating room suites.

Table 4: Scheduled Cleaning in Operating Room Suites (sample)

Item to be cleaned	Frequency
Ceilings, including air conditioning and ventilation grills/vents and light fixtures	Twice yearly
Walls, including all doors and windows	Monthly
Floors, including baseboards, corners and edges	Monthly
Store rooms and storage areas	Monthly
Exterior surfaces of machines and equipment	Monthly
Refrigerators and ice machines	Monthly
Furniture, including wheels/casters	Weekly
Sterilizers, cabinets and doors (interior and exterior)	Weekly
All horizontal surfaces (all shelving, computers, keyboards etc.)	Weekly
Offices, lounges and locker rooms	Daily

2. Medical Device Reprocessing Departments

Sterile processing areas in medical device reprocessing departments and other areas that store sterile supplies require Hospital Clean and a schedule that ensures that counters, shelves and floors are cleaned at least daily. The sample schedule in Box 26 is based on the Canadian Standards Association's standard Z314.3-09, '*Effective Sterilization in Health Care Facilities by the Steam Process*'.[202]

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

Sterile Processing Areas

- Clean all counters and floors daily
- Clean shelves daily in sterilization areas, preparation and packing areas and decontamination areas
- Clean shelves every three months in sterile storage areas
- Clean case carts after every use
- 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"

3. Laboratories

Clinical laboratories in Ontario should follow the Public Health Agency of Canada's '*Laboratory Biosafety Guidelines*'[133] (2004) recommendations regarding environmental cleanliness in the laboratory (available online at: http://www.phac-aspc.gc.ca/ols-bsl/lbg-ldmbl/index-eng.php).

- See Box 27 for a sample procedure for environmental cleaning in the laboratory setting.

BOX 27: 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 must not be stored in contact with street clothing
- Contaminated clothing must 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

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

4. Haemodialysis Centres

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

The patient's haemodialysis station is comprised of the bed or dialysis chair, table and dialysis machine with its components. Any item taken into a haemodialysis station could become contaminated with blood and other body fluids and serve as a vehicle of transmission to other patients either directly or by contamination via the hands of staff. Each haemodialysis station should be treated as an individual entity and hand hygiene must be performed on entry to the station and at exit from the station, before doing other tasks in the unit.

Items that cannot be adequately cleaned and disinfected should not be taken into a haemodialysis station.

Items taken to a patient's haemodialysis 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. Items that cannot be adequately cleaned and disinfected should not be taken into a haemodialysis station. Unused medications or supplies taken to the patient's station should not be returned to a common clean area or used on other patients.[203]

The external surfaces of the haemodialysis machine and its components are the most likely sources for contamination with bloodborne 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).[203]

Blood contaminated waste generated by the haemodialysis facility should be handled as biomedical waste (see Section II - 4). All disposable items should be placed in bags thick enough to prevent leakage.

- See Box 28 for a sample procedure for routine environmental cleaning in the haemodialysis setting.

BOX 28: Sample Routine Environmental Cleaning in the Haemodialysis Unit

Nursing Staff

- Take only what is required for a patient's treatment into the haemodialysis 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) after each treatment

Environmental Services/Housekeeping Staff – after each haemodialysis treatment or procedure

Sufficient time between patients must be allotted for adequate cleaning

- Remove waste, including biomedical waste and filled sharps containers
- Replace soap, paper towels, alcohol-based hand rub as required
- Clean surfaces at the dialysis station, including the bed or chair, countertops, tables and external surfaces of the dialysis machine (including waste containers) with a hospital-grade disinfectant
- Clean spills of blood as described in Box 32

Environmental Services/Housekeeping Staff – at end of day

- Clean remainder of the haemodialysis facility using a Hospital Clean regimen (see Box 4)
- 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 Prevention Transmission of Infections Among Chronic Hemodialysis Patients*', MMWR April 27, 2001/50(RR05):p.17-22.

F. Nurseries and Neonatal Intensive Care Units (NICUs)

Routine daily cleaning in nurseries and neonatal intensive care units (NICUs) 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 NICUs must not be toxic to infants (e.g., phenolics must not be used).

Milk preparation areas may become contaminated and must be cleaned by ES daily and cleaned by milk preparation staff between mothers. Refrigerators and freezers should have a regular cleaning schedule and not be used for preparing or storing other items such as food, specimens or medications.

- See Box 29 for a sample procedure for cleaning isolettes in NICUs.

BOX 29: 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/Housekeeping Staff

DO NOT USE PHENOLIC DISINFECTANTS

- Check for sharps inside isolette and items in the isolette
- 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
- Cover isolette with a baby blanket, and indicate cleaning date

Scheduled Cleaning

- 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 (CPS/SPD) after use

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

1.3 Cleaning Frequencies and Levels of Cleaning and Disinfection

The frequency of cleaning and the level of cleaning are dependent upon the risk classification of the area to be cleaned. See Section II - 2.2 for information about risk stratification.

- Refer to Appendix B, '*Risk Stratification Matrix for Determine Frequency of Cleaning*' for recommendations regarding cleaning frequency.

Recommendations:

68. At a minimum, emergency room/urgent care bathrooms should:
a) be cleaned at least every four hours;
b) preferably be disinfected with a sporicidal agent;
c) be frequently inspected and re-cleaned if necessary; and
d) be cleaned more frequently based on need. [All]

69. ***Areas that have toys must have policies and procedures for cleaning the toys. [All]***
70. ***All equipment must be cleaned and disinfected between patients/residents, including transport equipment. [All]***
71. ***Health care settings must have policies and procedures for cleaning specialized areas, such as haemodialysis units, operating room suites and laboratories. [All]***

2. Cleaning and Disinfection Practices for Patients/Residents on Additional Precautions

In addition to routine cleaning, additional cleaning practices and/or the use of personal protective equipment for cleaning may be required in health care settings under special circumstances.

Rooms on Additional Precautions should be minimally stocked with supplies. There should not be more than one day's supplies available inside the room. Before entering the room, cleaning equipment should be assembled before applying PPE. PPE must be removed, placed in an appropriate receptacle and hands cleaned before moving to another room or task. PPE must not be worn outside the client/patient/resident room or bed space.

Protocols for cleaning must include cleaning of portable isolation carts or built-in holders for isolation equipment.

2.1 Cleaning Rooms/Cubicles on Contact Precautions

Cleaning patient/resident rooms when an individual is on Contact Precautions requires the addition of PPE, as noted on the sign outside the room, as well as some extra procedures for patients/residents with VRE or *C. difficile*. All ES staff entering a room on Contact Precautions must put on a gown and gloves on entering the room, and must remove them and perform hand hygiene on leaving the room.

Sufficient time must be allowed for cleaning rooms of patients/residents on Contact Precautions.

Sufficient time must be allowed for cleaning and disinfection of rooms of patients/residents on Contact Precautions, particularly for *C. difficile* or norovirus.

A. Contact Precautions - VRE

Stringent protocols are required for the daily cleaning and disinfection of rooms contaminated with VRE. Routine cleaning and disinfection may not be adequate to remove VRE from contaminated surfaces.[199] There has been reported success in ending an outbreak of VRE using intensive environmental disinfection with twice-daily cleaning.[59]

- See the Ministry of Health and Long-Term Care's '*Best Practices for Infection Prevention and Control of Resistant Staphylococcus aureus and Enterococci in All Health Care Settings*'[199] for specific information regarding cleaning and disinfection for VRE (available online at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/ic_staff.html).

Specific requirements include:

a) there must be a process to ensure that there has been adequate cleaning and disinfection of rooms and shared equipment following client/patient/resident discharge; this may be accomplished through the use of a task checklist to ensure that all areas and surfaces are cleaned and disinfected and that post-cleaning inspection of the room has taken place;[199]
    - Refer to Appendix D for a sample task checklist for VRE rooms.
b) no special precautions are required for linen;
c) all curtains (privacy, window and shower) should be removed and laundered when soiled and after discharge/transfer of a patient/resident with VRE;[199, 204] and

d) transport equipment and equipment or surfaces which have had direct or indirect contact with a client/patient/resident who is colonized or infected with VRE and who undergoes a medical, surgical or diagnostic procedure in another department, must be cleaned and disinfected immediately after the client/patient/resident leaves, following protocols for VRE cleaning and disinfection.[199]

- See Box 30 for a sample cleaning protocol for rooms of patients/residents on Contact Precautions for VRE.

BOX 30: Sample Procedure for Cleaning Rooms of Patients/Residents on Contact Precautions for VRE

Daily Cleaning

In addition to the procedure listed in Box 15:

- Use a fresh bucket and mop head (dust mop and wet mop) for each VRE room (and only for that VRE room)
- After cleaning, apply a low-level disinfectant to all surfaces in the room and ensure sufficient contact time with the disinfectant as per manufacturer's instructions (omit this step if the cleaning product is also a low-level disinfectant)

Terminal Cleaning ('Discharge Cleaning')

In addition to the procedure listed in Box 16:

- Remove all dirty/used items (e.g. suction container, disposable items)
- Remove curtains (privacy, window, shower) before starting to clean the room
- Discard the following:
  - Soap
  - Toilet paper
  - Paper towels
  - Glove box
  - Toilet brush
- Use fresh cloths, mop, supplies and solutions to clean the room
- Use several cloths to clean a room. Use each cloth one time only, do not dip a cloth back into disinfectant solution after use to re-use on another surface. **THERE IS TO BE NO RE-USE OF USED CLOTHS**
- Clean and disinfect all surfaces and allow for the appropriate contact time with the disinfectant
- Replace curtains with clean curtains

Source: Ministry of Health and Long-Term Care, '*Best Practices for Infection Prevention and Control of Resistant Staphylococcus aureus and Enterococci in All Health Care Settings*'. March 2007

B. Contact Precautions - MRSA

1. Routine Cleaning

The routine daily cleaning practices specified in Box 15 may be used for rooms contaminated with MRSA.

2. Discharge/Terminal Cleaning

The terminal cleaning practices specified in Box 16 may be used for rooms contaminated with MRSA with the addition of:

a) extra supplies left in the room must be disinfected, sent for reprocessing or discarded;
b) floors should be cleaned;
c) all horizontal surfaces and high-touch surfaces in the room and bathroom must be disinfected after cleaning;
d) all curtains (privacy, window and shower) should be removed and laundered after discharge/transfer of a patient/resident with MRSA;[204]
e) all equipment in the room must be disinfected before it is removed from the room; and
f) all items (e.g., cloths, mop heads) used to clean an MRSA room must be laundered or discarded; they must not be used to clean any other room or bed space.

- See the Ministry of Health and Long-Term Care's '*Best Practices for Infection Prevention and Control of Resistant Staphylococcus aureus and Enterococci in All Health Care Settings*'[199] for specific information regarding MRSA. Available online at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/ic_staff.html.

C. Contact Precautions - *Clostridium difficile*

Specialized cleaning and disinfection practices are required for *C. difficile*. *C. difficile* is a spore-forming bacterium which can persist in the environment for months.[43, 205] Control is facilitated through thorough cleaning and disinfection of the patient environment.

C.difficile spores are only killed by sporicidal agents. The following sporicides have shown activity against *C.difficile* spores:

- sodium hypochlorite (1000 parts per million - ppm)[53, 206, 207]
- accelerated hydrogen peroxide (4.5%)
- peracetic acid (1.6%)[208]

Other sporicidal agents are under development. For adequate removal of *C. difficile*, the use of a sporicidal agent for disinfection after the room has been cleaned should be considered, in consultation with Infection Prevention and Control and Occupational Health and Safety.

Environmental contamination with *C. difficile* is most concentrated in patients' rooms,[67] making these areas the focus of stringent cleaning methods. Specific recommendations include[209]:

a) twice daily cleaning of patient/resident room with a hospital-grade disinfectant;
b) twice daily disinfection of patient/resident bathroom with a sporicidal agent; and
c) if using a QUAT for cleaning, thorough rinsing before applying an accelerated hydrogen peroxide agent is required.

- See the Ministry of Health and Long-Term Care's '*Best Practices for the Management of Clostridium difficile in All Health Care Settings*'[198] for specific information regarding environmental cleaning for *C. difficile*. Available online at: http://www.health.gov.on.ca/english/providers/program/infectious/diseases/ic_cdiff.html.

- See Box 31 for a sample cleaning protocol for rooms of patients/residents on Contact Precautions for *C. difficile*.

BOX 31: Sample Procedure for Cleaning Rooms of Patients/Residents on Contact Precautions for *C. difficile*

Daily Cleaning – clean twice per day

In addition to the procedure listed in Box 15:

- Use a fresh bucket and mop head (dust mop and wet mop) for each room
- After cleaning, apply a sporicidal disinfectant to all surfaces in the room and ensure sufficient contact time with the disinfectant (omit this step if the cleaning product is also a sporicidal disinfectant)

Terminal Cleaning ('Discharge Cleaning') – double cleaning

In addition to the procedure listed in Box 16:

- Remove all dirty/used items (e.g. suction container, disposable items)
- Remove curtains (privacy, window, shower) before starting to clean the room
- Discard and replace the following:
  - Soap
  - Toilet paper
  - Paper towels
  - Glove box
  - Toilet brush
- Use fresh cloths, mop, supplies and solutions to clean the room
- Use several cloths to clean a room. Use each cloth one time only, do not dip a cloth back into disinfectant solution after use to re-use on another surface. **THERE IS TO BE NO RE-USE OF USED CLOTHS**
- Clean and disinfect all surfaces and allow for the appropriate contact time with the disinfectant
- Using fresh cloths, mop, supplies and solutions, re-clean and disinfect the room, using the above procedure
- Replace curtains with clean curtains following second cleaning

Adapted from: Ministry of Health and Long-Term Care's, '*Best Practices Document for the Management of Clostridium difficile in All Health Care Settings*', January 2009; and from the proceedings of the International Infection Control Council Global Consensus Conference on *Clostridium difficile*- Associated Diarrhea (CDAD) held in Toronto August 23-24, 2007.

D. Contact Precautions – Norovirus

Noroviruses are a group of non-enveloped viruses that cause acute gastroenteritis in humans. Noroviruses are highly contagious and are transmitted in health care settings by direct person-to-person contact; by hand transfer of the virus after touching contaminated materials and environmental surfaces; or via droplets from vomitus.[210] Outbreaks of norovirus in hospitals and long-term care homes may be prolonged due to the potentially high level of environmental contamination and regular introduction of susceptible individuals.[211] Noroviruses can survive well in the environment for at least 12 days.[212]

Products used for disinfection of norovirus must have an appropriate virucidal claim. Most QUATs do not have significant activity against noroviruses. In some jurisdictions, hypochlorite at 1000 ppm is recommended.[210, 213] Norovirus is inactivated by heat at 60ºC.[214] Vacuum cleaning carpets and buffing floors during an outbreak have the potential to re-circulate norovirus and are not recommended.[213]

Cleaning regimens for norovirus should include:

a) prompt cleaning of emesis and faeces, including items in the immediate vicinity, followed by disinfection with an appropriate virucidal disinfectant;
b) increased frequency of bathroom and toilet cleaning and disinfection on affected units [213];
c) replacement of privacy curtains on terminal cleaning[213];
d) steam cleaning carpet and soft furnishings following regular cleaning, provided they are heat tolerant and at least 60ºC is achieved by the unit; and
e) strict adherence to hand hygiene.

For guidance regarding cleaning bathrooms in Emergency/urgent care, see Section III - 1.2.B.

2.2 Cleaning Rooms/Cubicles on Droplet Precautions

ES staff entering a room on Droplet Precautions must wear facial protection (i.e., mask and eye protection) when working within two metres of a client/patient/resident on Droplet Precautions.

1. Routine Cleaning

The routine daily cleaning practices specified in Box 15 may be used for rooms on Droplet Precautions. Because some microorganisms transmitted by the droplet route 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 client/patient/resident.

2. Terminal Cleaning

The terminal cleaning practices specified in Box 16 may be used for rooms on Droplet Precautions.

2.3 Cleaning Rooms on Airborne Precautions

ES staff entering a room on Airborne Precautions for tuberculosis must wear a fit-tested and seal-checked N95 respirator. Only immune staff may enter a room where airborne precautions are in place for measles or varicella; an N95 respirator is not required. The door must be kept closed to maintain negative pressure, even if the client/patient/resident is not in the room.

1. Routine Cleaning

The routine daily cleaning practices specified in Box 15 may be used for rooms on Airborne Precautions.

2. Terminal Cleaning

The terminal cleaning practices specified in Box 16 may be used for rooms on Airborne Precautions. The following additional measures must be taken:

a) after patient/resident transfer or discharge, the door must be kept closed and the Airborne Precautions sign must remain on the door until sufficient time has elapsed to allow removal of airborne microorganisms (dependent on air changes per hour); for more information, see the Ministry of Health and Long-Term Care's '*Routine Practices and Additional Precautions for All Health Care Settings*'[6];
b) it is preferable to wait for sufficient air changes to clear the air before cleaning the room;
c) if the room is urgently needed before the air has been sufficiently cleared of tubercle bacilli, an N95 respirator must be worn during cleaning; and
d) remove N95 respirator only after leaving room and door has been closed.

Recommendations:

72. ***Health care settings must have policies and procedures for the daily and terminal cleaning of rooms on Contact Precautions for VRE and C. difficile. [AII]***

3. Cleaning Spills of Blood and Body Substances

Spills of blood and other body substances, such as urine, faeces and emesis, must be contained, cleaned and the area disinfected immediately. The health care setting shall have written policies and procedures for dealing with biological spills that include[132]:

a) clearly defined assignment of responsibility for cleaning the spill in each area of the health care setting during all hours when a biological spill might occur;
b) provision for timely response;
c) a method for the containment and isolation of the spill;
d) training of staff who will clean the spill;
e) access to PPE, equipment, supplies, waste and linen disposal for staff who will clean the spill;
f) proper disposal of waste;
g) procedure to be followed if there is a staff exposure to biological material; and
h) documentation of the spill incident.

3.1 Procedure for Cleaning a Spill of Blood or Body Substance:

The protocol described in Box 32 should be used when cleaning and disinfecting a spill of blood or other body substance[3, 124]:

BOX 32: Sample Procedure for Cleaning a Biological Spill

- 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).
- 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 so wet that blood can be squeezed out of them, in which case they must be segregated into the biomedical waste container (i.e., yellow bag).
- 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 must be taken to avoid splashing or generating aerosols during the clean up.
- Remove gloves 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 health care and allied systems*', 2004.

3.2 Procedure for Cleaning a Spill of Blood or Body Substance on Carpet

The protocol described in Box 33 should be used when cleaning and disinfecting a spill of blood or other body substance on carpet[13].

BOX 33: Sample Procedure for Cleaning a Biological Spill on Carpet

- 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).
- Mop up as much of the spill as possible using disposable towels.
- 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 so wet that blood can be squeezed out of them, in which case they must be segregated into the biomedical waste container (i.e., yellow bag).
- Remove gloves 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, must 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

Recommendations:

73. ***Health care settings shall have written policies and procedures dealing with spills of blood and other body fluids.***

IV. Summary of Recommendations

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
1. Principles of Cleaning and Disinfecting Environmental Surfaces in a Health Care Environment						
1.	***Health care settings should have policies that include the criteria to be used when choosing finishes, furnishings and equipment for client/patient/resident 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 health care settings. [BIII]***					
3.	***In all health care settings:*** ***a) there must be a regular cleaning regimen in place; [BIII]*** ***b) worn, stained, cracked or torn furnishings must be replaced when identified; [AII]*** ***c) upholstered furniture and other cloth or soft furnishings that cannot be cleaned and disinfected must not be used in care areas, especially where immunocompromised patients are located; the health care facility should have a plan to replace cloth furnishings with furnishings that can be cleaned and disinfected. [BIII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
	ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS					
4.	***Surfaces, furnishings, equipment and finishes in health care settings should:*** ***a) be easily maintained and repaired;*** ***b) be cleanable with hospital-grade detergents, cleaners and disinfectants (except furnishings in long-term care homes where the furniture is supplied by the resident); and*** ***c) be smooth, nonporous, seamless and unable to support microbial viability. [BII]***					
5.	***Cloth items should:*** ***a) be easily maintained and repaired;*** ***b) be seamless or double-stitched;*** ***c) be resistant to mould;*** ***d) be cleanable with hospital-grade detergents, cleaners and disinfectants; and*** ***e) be quick-drying. [BII]***					
6.	***Antimicrobial-treated surfaces are not recommended. [CIII]***					
7.	***Do not carpet areas that house or serve immunocompromised patients or where there is a high likelihood of contamination with blood or body fluids. [BII]***					
8.	***If used, carpet must:*** ***a) be cleanable with hospital-grade cleaners and disinfectants;*** ***b) be cleaned by trained staff using specialized cleaning equipment and procedures;***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
	c) be removed and replaced when worn or stained; and ***d) dry quickly to reduce the likelihood of mould accumulation. [BIII]***					
9.	***Clean plastic coverings with compatible agents on a regular basis and replace if damaged. [BII]***					
10.	***Equipment that cannot be adequately cleaned, disinfected or covered, including electronic equipment, should not be used in the care environment. [BII]***					
11.	***Cleaning and disinfection should be done as soon as possible after items have been used. [BII]***					
12.	***Cleaning and disinfecting products must:*** ***a) be approved by Environmental Services, Infection Prevention and Control and Occupational Health and Safety;*** ***b) have a drug identification number (DIN) from Health Canada;*** ***c) be compatible with items and equipment to be cleaned and disinfected; and*** ***d) be used according to the manufacturers' recommendations. [BII]***					
13.	***Disinfectants chosen for use in health care should:*** ***a) be active against the usual microorganisms encountered in the health care setting;*** ***b) ideally require little or no mixing or diluting;***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
	ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS					
	c) be active at room temperature with a short contact time; ***d) have low irritancy and allergenic characteristics; and*** ***e) be safe for the environment. [BIII]***					
14.	***Effective use of a hospital-grade disinfectant includes:*** ***a) application of disinfectant only after visible soil and other impediments to disinfection have been removed;*** ***b) use on non-critical equipment;*** ***c) following the manufacturer's instructions for dilution and contact time;*** ***d) frequently changing disinfectant solution with no 'double-dipping' of cloths into disinfectant*** ***e) appropriate use of personal protective equipment, if required, to prevent exposure to the disinfectant. [BIII]***					
15.	***Non-critical medical equipment, including equipment provided by outside agencies, must be capable of being effectively cleaned and disinfected according to recommended standards. [BII]***					
16.	***Equipment that is used for cleaning and disinfecting must itself be cleaned and disinfected according to recommended standards. [BII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
17.	***Non-critical medical equipment, including equipment provided by outside agencies, must have written, item-specific manufacturer's cleaning and disinfection instruction. [BII]***					
2. Principles of Infection Prevention and Control Related to Environmental Cleaning						
18.	***Environmental Services staff must adhere to Routine Practices and Additional Precautions when cleaning. [BII]***					
19.	***Environmental Services staff must follow best practices for hand hygiene. [AII]***					
20.	***Each health care setting must have policies and procedures to ensure that cleaning:*** ***a) takes place on a continuous and scheduled basis;*** ***b) incorporates principles of infection prevention and control;*** ***c) clearly defines cleaning responsibilities and scope;*** ***d) meets all statutory requirements; and*** ***e) allows for surge capacity during outbreaks. [BIII]***					
21.	***Personal protective equipment (PPE) must be:*** ***a) sufficient and accessible for all cleaning staff;*** ***b) worn as required by Routine Practices, Additional Precautions and MSDSs when handling chemicals; and*** ***c) removed immediately after the task for which it is worn. [BII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
22.	***Gloves must be removed and hand hygiene performed on leaving each client/patient/resident room or bed space. Soiled gloves must not be worn when walking from room to room or other areas of the health care facility. [AIII]***					
23.	***Housekeeping in the health care setting should be performed on a routine and consistent basis to provide for a safe and sanitary environment. [BIII]***					
24.	***Adequate resources must be devoted to Environmental Services in all health care settings that include:*** ***a) single individual with assigned responsibility for the care of the physical facility;*** ***b) written procedures for cleaning and disinfection of care areas and equipment that include:*** ***i. defined responsibility for specific items and areas;*** ***ii. procedures for daily and terminal cleaning;*** ***iii. procedures for cleaning in construction/renovation areas;*** ***iv. procedures for cleaning and disinfecting areas contaminated with VRE and C. difficile;*** ***v. procedures for outbreak management;*** ***vi. cleaning standards and frequency;*** ***c) adequate human resources to allow thorough and timely cleaning;*** ***d) education and continuing education of cleaning***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
	staff; ***e) monitoring of environmental cleanliness; and*** ***f) ongoing review of procedures. [BII]***					
25.	***If housekeeping services are contracted out, the Occupational Health and Safety policies of the contracting services must be consistent with the facility's Occupational Health and Safety policies. [BII]***					
26.	***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]***					
27.	***Cleaning schedules should be developed, with frequency 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/residents housed in the area; and the probability of contamination. [BIII]***					
28.	***Non-critical medical equipment requires cleaning and disinfection after each use. [AII]***					
29.	***Each health care setting should have written policies and procedures for the appropriate cleaning of non-critical medical equipment that clearly defines the frequency and level of cleaning and which assigns responsibility for the cleaning. [BIII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
30.	***If the facility does its own laundry, published laundry regulations must be followed.***					
31.	***There must be clear separation between clean and dirty laundry. [AII]***					
32.	***There must 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]***					
33.	***There must be designated areas for storing clean linen. [BII]***					
34.	***Routine laundering practices are adequate for laundering all linens, regardless of source. [BII]***					
35.	***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.***					
36.	***Waste handlers must wear personal protective equipment appropriate to their risk. [AII]***					
37.	***Non-immunized waste handlers must be offered hepatitis B immunization. [AII]***					
38.	***Waste that is transported within a health care setting:*** ***a) should be transported following clearly defined transport routes;*** ***b) should not be transported through clean zones, public areas, or patient/resident care units;*** ***c) should not be transported on the same elevator as clients/patients/residents or clean/sterile***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
	instruments/supplies; if a dedicated elevator is not available, transport waste at a different time from patients/residents or clean/sterile instruments/supplies; and ***d) should be transported in leak-proof and covered carts which are cleaned on a regular basis. [BII]***					
39.	***There shall be a system in place for the prevention of sharps injuries and the management of sharps injuries when they occur.***					
40.	***Cleaning agents and disinfectants shall be labelled with WHMIS information.***					
41.	***Cleaning agents and disinfectants shall be stored in a safe manner in storage rooms or closets.***					
42.	***Automated dispensing systems, which are monitored regularly for accurate calibration, are preferred over manual dilution and mixing. [BIII]***					
43.	***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]***					
44.	***Equipment used to clean toilets:*** ***a) should not be carried from room-to-room;*** ***b) should be discarded when the patient/resident leaves and as required; and*** ***c) should minimize splashing. [BIII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
45.	***Sufficient housekeeping rooms/closets should be provided throughout the facility to maintain a clean and sanitary environment. [BIII]***					
46.	***Housekeeping rooms/closets:*** ***a) should not be used for other purposes;*** ***b) shall be maintained in accordance with good hygiene practices;*** ***c) should have eye protection available;*** ***d) should have an appropriate water supply and a sink/floor drain;*** ***e) should be well ventilated and suitably lit;*** ***f) should have locks fitted to all doors;*** ***g) should be easily accessible to the area;*** ***h) should be appropriately sized to the equipment used in the room;*** ***i) should not contain personal supplies, food or beverages;*** ***j) shall have safe chemical storage and access;*** ***k) should be free from clutter; and*** ***l) should be ergonomically designed. [BII]***					
47.	***Cleaning equipment should be well maintained, in good repair and be cleaned and dried between uses. [BIII]***					
48.	***Mop heads should be laundered daily and dried thoroughly before storage. [BIII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
49.	***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]***					
50.	***Soiled utility rooms/workrooms should:*** ***a) be readily available close to point-of-care in each patient/resident care area;*** ***b) be separate from clean supply/storage areas;*** ***c) contain a work counter and clinical sink;*** ***d) contain a dedicated hand washing sink;*** ***e) contain equipment required for the disposal of waste;*** ***f) contain personal protective equipment for staff protection during cleaning and disinfection procedures; and*** ***g) be sized adequately for the tasks required. [BII]***					
51.	***Clean supply rooms/areas should:*** ***a) be readily available in each patient/resident care area;*** ***b) be separate from soiled areas;*** ***c) protect supplies from dust and moisture;*** ***d) be easily available to staff; and*** ***e) contain a work counter and dedicated hand washing sink if used for preparing patient care items. [BII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
52.	***Health care settings must 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]***					
53.	***All health care settings must have a plan in place to deal with a flood. [AII]***					
54.	***Infection Prevention and Control, Environmental Services and Occupational Health and Safety must be consulted before making any changes to cleaning and disinfection procedures and technologies in the health care setting. [BIII]***					
55.	***All aspects of environmental cleaning must be supervised and performed by knowledgeable, trained staff. [BIII]***					
56.	***Environmental Services must provide a training program which includes:*** ***a) a written curriculum;*** ***b) a mechanism for assessing proficiency;*** ***c) documentation of training and proficiency verification; and*** ***d) orientation and continuing education. [BIII]***					
57.	***Infection prevention and control education provided to staff working in Environmental Services should be developed in collaboration with Infection Prevention and Control and Occupational Health and Safety and must include:***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
	a) the correct and consistent use of Routine Practices; ***b) hand hygiene and basic personal hygiene;*** ***c) signage used to designate Additional Precautions in the health care setting;*** ***d) the appropriate use of personal protective equipment (PPE); and*** ***e) prevention of blood and body fluid exposure, including sharps safety. [BIII]***					
58.	***Environmental Services managers and supervisors must receive training and be certified. [BIII]***					
59.	***There should be a process in place to measure the quality of cleaning in the health care setting. [BII]***					
60.	***Methods of auditing should include both visual assessment and at least one of the following tools: residual bioburden or environmental marking. [BII]***					
61.	***Results of cleaning audits should be collated and analysed with feedback to staff, and an action plan developed to identify and correct deficiencies. [BIII]***					
62.	***Environmental Services staff must be offered appropriate immunizations. [AII]***					
63.	***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 airborne infection isolation room accommodating a patient with tuberculosis.***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
64.	***There must be 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]***					
65.	***There must be procedures for the evaluation of staff who experience sensitivity or irritancy to chemicals. [AII]***					
66.	***Aerosol or trigger sprays for cleaning chemicals should not be used. [BIII]***					
67.	***Selection of housekeeping cleaning equipment must follow ergonomic principles. [AII]***					
3. Cleaning and Disinfection Practices for All Health Care Settings						
68.	***At a minimum, emergency room/urgent care bathrooms should:*** ***a) be cleaned at least every four hours;*** ***b) preferably be disinfected with a sporicidal agent;*** ***c) be frequently inspected and re-cleaned if necessary; and*** ***d) be cleaned more frequently based on need. [AII]***					
69.	***Areas that have toys must have policies and procedures for cleaning the toys. [AII]***					
70.	***All equipment must be cleaned and disinfected between patients/residents, including transport equipment. [AII]***					

	Recommendation	Compliant	Partial Compliance	Non-compliant	Action Plan	Accountability
ENVIRONMENTAL CLEANING IN ALL HEALTH CARE SETTINGS						
71.	***Health care settings must have policies and procedures for cleaning specialized areas, such as haemodialysis units, operating room suites and laboratories. [AII]***					
72.	***Health care settings must have policies and procedures for the daily and terminal cleaning of rooms on Contact Precautions for VRE and C. difficile. [AII]***					
73.	***Health care settings shall have written policies and procedures dealing with spills of blood and other body fluids.***					

Appendix A: 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.
Grading of 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.

Appendix B: Risk Stratification Matrix to Determine Frequency of Cleaning

FOR EACH CLIENT/PATIENT/RESIDENT AREA/DEPARTMENT:

STEP 1: Categorize the factors that will impact on environmental cleaning:

PROBABILITY OF CONTAMINATION WITH PATHOGENS

Heavy Contamination (score = 3)
An area is designated as being heavily contaminated if 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, haemodialysis station, Emergency room, client/patient/resident bathroom if visibly soiled).

Moderate Contamination (score = 2)
An area is designated as being moderately contaminated if surfaces and/or equipment does not routinely (but may) become contaminated with blood or other body fluids and the contaminated substances are contained or removed (e.g. wet sheets). All client/patient/resident rooms and bathrooms should be considered to be, at a minimum, moderately contaminated.

Light Contamination (score = 1)
An area is designated as being lightly contaminated if surfaces are not exposed to blood, other body fluids or items that have come into contact with blood or body fluids (e.g., lounges, libraries, offices).

VULNERABILITY OF POPULATION TO ENVIRONMENTAL INFECTION

More Susceptible (score = 1)
Susceptible clients/patients/residents are those who are most susceptible to infection due to their medical condition or lack of immunity. These include those who are immunocompromised (oncology, transplant and chemotherapy units), neonates (level 2 and 3 nurseries) and those who have severe burns (i.e., requiring care in a burn unit).

Less Susceptible (score = 0)
For the purpose of risk stratification for cleaning, all other individuals and areas are classified as less susceptible.

POTENTIAL FOR EXPOSURE

High-touch surfaces (score = 3)
High-touch surfaces are those that have frequent contact with hands. Examples include doorknobs, telephone, call bells, bedrails, light switches, wall areas around the toilet and edges of privacy curtains.

Low-touch surfaces (score = 1)
Low-touch surfaces are those that have minimal contact with hands. Examples include walls, ceilings, mirrors and window sills.

STEP 2: Determine the total risk stratification score:

For each functional area or department, the frequency of cleaning is based on the factors listed in the boxes above. A score is given if the factors are present, and the frequency of cleaning is based on the total score as derived in the following matrix:

Probability of Contamination with Pathogens	Potential for Exposure			
	High-touch Surfaces (score = 3)		Low-touch Surfaces (score = 1)	
	More Susceptible Pop'n (score = 1)	Less Susceptible Pop'n (score = 0)	More Susceptible Pop'n (score = 1)	Less Susceptible Pop'n (score = 0)
Heavy (score = 3)	7	6	5	4
Moderate (score = 2)	6	5	4	3
Light (score = 1)	5	4	3	2

STEP 3: Determine the cleaning frequency based on the risk stratification matrix:

Depending on the total score resulting from the risk stratification matrix above, cleaning frequencies for each functional area or department are derived:

Total Risk Score	Risk Type	Minimum Cleaning Frequency
7	High Risk	Clean after each case/event/procedure and at least twice per day Clean additionally as required
4-6	Moderate Risk	Clean at least once daily Clean additionally as required (e.g., gross soiling)
2-3	Low Risk	Clean according to a fixed schedule Clean additionally as required (e.g., gross soiling)

Examples Using the Risk Stratification Matrix to Determine the Cleaning Frequency of Specific Areas:

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	Interpretation
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 daily Clean additionally as required
Burn Unit	2	3	1	6	Clean at least once daily Clean additionally as required
Cardiac Catheterization and Angiodynography Area	3	3	1	7	Clean after each case/event/procedure and at least twice per day Clean additionally as required
Chemotherapy Unit	2	3	1	6	Clean at least once daily 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 daily Clean additionally as required
			1	7	Clean after each case/event/procedure and at least twice per day Clean additionally as required
Dental Procedure Room	3	3	0	6	Clean at least once daily Clean additionally as required
			1	7	Clean after each case/event/procedure and at least twice per day 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	Interpretation
Diagnostic Imaging	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
			1	3	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
Echocardiography	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
			1	3	Clean according to a fixed schedule Clean additionally as required
Emergency Room - patient cubicle	2	3	0	5	Clean at least once daily Clean additionally as required
	2	3	1	6	Clean at least once daily Clean additionally as required
	3	3	0	6	Clean at least once daily Clean additionally as required
	3	3	1	7	Clean after each case/event/procedure and at least twice per day Clean additionally as required
Emergency Room - trauma room	3	3	1	7	Clean after each case/event/procedure and at least twice per day Clean additionally as required
Emergency Room - other	1	3	0	4	Clean at least once daily Clean additionally as required
Equipment Reprocessing Area (CPS/SPD)	3	3	0	6	Clean at least once daily Clean additionally as required
Haemodialysis Station	3	3	1	7	Clean after each case/event/procedure and at least twice per day 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	Interpretation
Haemodialysis Unit - excluding dialysis stations	2	3	0	5	Clean at least once daily Clean additionally as required
Intensive Care Unit	3	3	1	7	Clean after each case/event/procedure and at least twice per day Clean additionally as required
Laboratory	3	3	0	6	Clean at least once daily Clean additionally as required
Labour and Birthing Rooms	3	3	1	7	Clean after each case/event/procedure and at least twice per day Clean additionally as required
Laundry - soiled linen	3	3	0	6	Clean at least once daily Clean additionally as required
Nuclear Medicine	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
			1	3	Clean according to a fixed schedule Clean additionally as required
Nursery (well baby)	1	1	0	2	Clean according to a fixed schedule Clean additionally as required
Occupational Therapy	1	3	0	4	Clean at least once daily 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 and at least twice per day 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	Interpretation
Pacemaker Insertion Room	3	3	0	6	Clean at least once daily Clean additionally as required
			1	7	Clean after each case/event/procedure and at least twice per day Clean additionally as required
Patient/Resident Room	2	3	0	5	Clean at least once daily Clean additionally as required
			1	6	Clean at least once daily Clean additionally as required
Pharmacy – admixture room	1	3	1	5	Clean at least once daily Clean additionally as required
Pharmacy – general purpose area	1	3	0	4	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 at least once daily Clean additionally as required
Procedure Room	3	3	0	6	Clean at least once daily Clean additionally as required
			1	7	Clean after each case/event/procedure and at least twice per day 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

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	Interpretation
Resident Activity Room (long-term care home)	2	3	0	5	Clean at least once daily Clean additionally as required
			1	6	Clean at least once daily Clean additionally as required
Respiratory Therapy	3	3	0	6	Clean at least once daily Clean additionally as required
			1	7	Clean after each case/event/procedure and at least twice per day 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 daily Clean additionally as required

Appendix C: Visual Assessment of Cleanliness

Visual assessment is only one of a number of methods available to assess the efficacy of cleaning. Visual assessment is most applicable to the monitoring of 'Hotel Clean' procedures. Evaluation of 'Hospital Clean' procedures should include other measures performed on a periodic basis, such as direct observation and environmental marking tools.

Quantification of Visual Assessment Techniques:	Example – 25 items inspected:	
Record a site as clean if dust and debris are absent	**Clean**	**= 20 items**
Record a site as dirty if any of these indicators are present	**Dirty**	**= 5 items**
Calculate the cleaning rate as a percentage	**Cleaning Rate**	**= 80% of items**

The pass rate for visually clean surfaces will vary with the type of activity taking place in the area. For Hospital Clean, visual assessment should have a cleaning rate of 100%. For Hotel Clean, 80% is acceptable.

Use the following descriptions of visual cleaning assessments applied to items to determine if cleaning is acceptable:

Item	Standard of Cleanliness
Alcohol-based hand rub dispensers	➢ will be free of visible dust, soiling, stains, and residue ➢ product will be replaced when empty ➢ floor beneath dispenser will be free of product
Assist rail	➢ will be free of visible dust, soiling, and stains ➢ loose and/or broken rails will be reported for repairs and/or replacement
Baseboard	➢ will be free of visible dust, debris, and soiling
Bed – air	➢ will be free of visible dust, soiling, stains, hair and strings from casters ➢ handles and controls will appear to be free of dust, soiling, and stains ➢ malfunctioning of electrical and/or mechanical, and deflated bladders will be reported for repair and/or replacement
Bed – includes electrical, mechanical and stretcher	➢ will be free of visible dust, soiling, stains, hair and strings from casters ➢ handles and controls will appear to be free of dust, soiling, and stains ➢ malfunctioning of electrical and/or mechanical will be reported for repair and/or replacement
Bedpan flusher/hopper	➢ will be free of visible dust, soiling, and stains. Leaks will be reported for repair
Bedside locker	➢ will be free of visible dust, soiling, medication, and stains - inside and outside ➢ casters will appear to be free of hair, strings, and grease/grit build-up ➢ inoperable casters, door and/or drawer will be reported for repair and/or replacement
Blind - shade, vertical/horizontal	➢ will be free of visible dust, debris, and soiling ➢ broken draw chain, gear and/or torn shade will be reported for repair and/or replacement
Blood pressure cuff	➢ will be free of visible dust, medication, soiling and stains
Bookcase	➢ will be free of visible dust and debris
Cabinet	➢ will be free of visible dust and soiling

Item	Standard of Cleanliness
Call bell and cord	➢ will be free of visible dust, soiling and hair ➢ frayed cord will be reported and replaced
Chair – hard surface and fabric	➢ will be free of visible dust, marks and soiling ➢ torn material, broken/loose armrest and/or legs will be reported for repair and/or replacement
Chair – geriatric	➢ will be free of visible dust, marks and soiling ➢ torn material, broken/loose armrest and/or legs will be reported for repair and/or replacement
Chair - wheelchair	➢ will be free of visible dust, soiling and medication ➢ deflated tires and inoperable wheelchair conditions will be reported for repair and/or replacement
Ceiling - painted	➢ will be free of visible marks, soiling, and dust/spider webs ➢ cracks and peeling paint will be reported for repair
Ceiling - acoustical	➢ will be free of visible marks, soiling, and dust/spider webs ➢ all broken and stained tiles will be reported for cleaning and/or replacement
Closet – locker	➢ will be free of visible dust and debris
Commode	➢ will be free of visible dust, medication, and soiling ➢ broken and loose armrests/legs, torn material will be reported for repair and/or replacement
Computer and keyboard	➢ will be free of visible dust, soil, smudges and stains
Couch	➢ will be free of visible soiling, stains and debris ➢ torn material, broken/loose armrest and/or legs will be reported for repair and/or replacement
Curtain – bed	➢ will be free of visible soiling and stains ➢ stained and/or torn material will be reported for repair and/or replacement
Curtain - tracks	➢ will be free of visible dust, soil, smudges and stains
Curtain – window	➢ will be free of visible soiling, stains ➢ stained and/or torn material will be reported for repair and/or replacement
Desk	➢ will be free of visible dust, debris, and smudges ➢ damaged or loose legs, drawers off guides will be reported for repair and/or replacement.
Door and handle/knob/plate	➢ will be free of visible dust, grease, dirt and scuff marks ➢ doors in need of repairs will be reported for repair and/or replacement
Dresser	➢ will be free of visible dust, debris, and smudges ➢ damaged or loose legs will be reported for repairs and/or replacement
Drinking fountain	➢ will be free of visible dust, soiling, and stains ➢ fixture will appear to be free of dust, soiling, and stains ➢ cracked and/or broken fountain bowl will be reported for repair and/or replacement ➢ leaking fixture will be reported for repair and/or replacement
Electric switch/plate	➢ will be free of visible dust, soiling and stains
Elevator/escalator and tracks	➢ will be free of visible dust, soil, smudges and stains
File cabinet	➢ will be free of visible dust and smudges
Fire sprinkler	➢ will be free of visible dust and soil
Floor – carpet	➢ will be free of debris, visible dust ➢ stains and spills will be scheduled immediately for extraction ➢ torn carpeting will be reported for repair and/or replacement

Item	Standard of Cleanliness
Floor – resilient	➢ will be free of debris, visible dust, and spills ➢ stains will be schedule to be scrubbed or stripped and refinished as needed
Floor – terrazzo	➢ will be free of visible debris, dust, and spills ➢ stains will be schedule to be scrubbed or stripped and refinished as needed
Floor – masonry	➢ will be free of visible debris, dust, and spills ➢ stains will be schedule to be scrubbed or stripped and refinished as needed
Floor – wood	➢ will be free of visible debris, dust, and spills ➢ gouged and/or scratched floor will be reported for repair and/or replacement
Floor drain	➢ will be free of visible dust, debris, and soiling
Furniture – small miscellaneous	➢ will be free of visible dust, debris, soiling and smudges
Glass inside	➢ will be free of visible dust, smudge marks, and adhesives ➢ chipped, cracked or broken glass will be reported for replacement
Glass outside	➢ will be free of visible dust, smudge marks, and adhesives ➢ chipped, cracked or broken glass will be reported for replacement
Hood – exhaust	➢ will be free of visible debris, dust, and grease
Horizontal surface	➢ will be free of visible dust, debris, stains, medications and spills
Hose & cord (medical equipment)	➢ will be free of visible dust and soiling
Ice machine	➢ will be free of visible dust and soiling ➢ leaks and/or malfunctioning will be reported for repair
Ice scoop	➢ will be replaced by a clean scoop every day
I.V. pole/pumps	➢ will be free of visible dust, adhesives, and soiling ➢ casters will be free of dust, debris, hair, and grease/grit build-up
Ledge and railing	➢ will be free of visible dust and smudge marks ➢ will be secure to the wall, if not secure, it will be reported for repair
Light – ceiling	➢ will be free of visible dust, soiling and dead pests ➢ cracked and/or broken lenses, and burnt out bulbs will be reported for replacement
Light - over bed	➢ will be free of visible dust, soiling and dead pests ➢ cracked and/or broken lenses, and burnt out bulbs will be reported for replacement.
Light - spot light	➢ will be free of visible dust, soiling and dead pests ➢ cracked and/or broken lenses, and burnt out bulbs will be reported for replacement
Light - desk & floor	➢ will be free of visible dust, soiling and dead pests ➢ cracked and/or broken lenses, and burnt out bulbs will be reported for replacement
Light – wall mounted	➢ will be free of visible dust, soiling and dead pests ➢ cracked and/or broken lenses, and burnt out bulbs will be reported for replacement
Linen hamper	➢ will be free of visible dust, debris, and hair and strings from casters
Mattress	➢ will be free of soiling and stains ➢ tears and cracks will be reported and mattress replaced
Mattress cover	➢ will be free of visible dust, soiling and stains ➢ tears and cracks will be reported and cover replaced
Mayo stand/table	➢ will be free of visible dust, soiling, stains, and hair and debris from casters
Microwave	➢ will be free of visible dust, food crumbs and stains ➢ malfunctioning will be reported for repair and/or replacement
Mirror	➢ will be free of visible dust, smudges, marks, and liquids ➢ cracked and/or broken mirrors will be reported for replacement and/or repair

Item	Standard of Cleanliness
Oven/stove	➢ will be free of visible dust, food, soiling ➢ if malfunctioning, will be repaired and/or replaced
Over bed table	➢ will be free of visible dust, food, medication, soiling, and stains ➢ casters will be free of hair, strings, and grease build-up ➢ malfunctioning table, inoperable casters, etc. will be repaired and/or replaced
Paper towel dispenser	➢ will be free visible dust, soiling, and stains ➢ dispenser will be refilled when empty
Phone stall & phone	➢ will be free of visible dust, debris, and smudges
Picture frame	➢ will be free of visible dust and debris
Pillow	➢ will be free of visible dust and stains ➢ tears and cracks will be reported and pillow replaced
Radiator	➢ will be free of visible dust, medication, and soiling ➢ leaks will be reported for repair
Refrigerator/freezer	➢ will be free of visible dust, interior frost, soiling, and stains ➢ if malfunctioning will be reported for repair and/or replacement
Refrigerator - medication	➢ will be free of visible dust, interior frost, soiling, and stains ➢ if malfunctioning will be reported for repair and/or replacement
Rubbish/waste container	➢ will be free of visible soiling ➢ all broken and/or cracked containers will be reported for replacement ➢ clean liner/liners will be placed in the container when cleaned ➢ container should be odour free
Sharps Container	➢ will be replaced when 2/3 full
Shelves	➢ will be free from visible dust, debris and soiling
Shower stall	➢ will be free of visible dust, soiling, soap scum, and stains ➢ fixtures will be free of dust, soiling, soap scum, and stains ➢ cracked and/or broken walls will be reported for repair and/or replacement
Sink – basin & fixtures & exposed piping	➢ will be free of visible dust, soiling, stains, and soap scum ➢ fixtures will be free of visible dust, soiling, stains, and soap scum ➢ drain pipe will be free of visible dust, soiling, and soap scum ➢ cracked and/or broken sinks will be reported for replacement ➢ leaking fixtures will be reported for repair and/or replacement ➢ grout will be clean and intact
Soap dispenser	➢ will be free of visible dust, soiling, stains, and soap scum ➢ soap cartridge will be replaced when empty
Stainless steel	➢ will be polished and visible free of dust, smudges, marks, and graffiti ➢ scratches and indelible markings will be reported for repair and/or replacement
Stairwell	➢ will be free of visible dust, debris, and spills
Table	➢ will be free of visible dust, smudges, soiling and stains ➢ broken and loose legs will be reported for repair and/or replacement
Telephone	➢ will be free of visible dust, soiling, smudges and stains
Television/monitor	➢ will be free of visible dust and smudges ➢ if malfunctioning will be reported for repair and/or replacement
Toilet & fixtures	➢ will be free of visible dust, soiling, and stains ➢ fixtures will be free of dust, soiling, and stains ➢ cracked or broken bowl and/or seat will reported for replacement ➢ leaking fixtures will reported for repair and/or replacement

Item	Standard of Cleanliness
Tub - bath & fixtures	➢ will be free of visible dust, soiling, soap scum, mould/mildew and stains ➢ fixtures will be free of dust, soiling, soap scum, and stains ➢ cracked and/or broken tub will be reported for repair and/or replacement
Tub - shower cabinet	➢ will be free of visible dust, soiling, soap scum, mould/mildew and stains ➢ fixtures will be free of dust, soiling, soap scum, and stains ➢ cracked and/or broken tub will be reported for repair and/or replacement
Tub – whirlpool	➢ will be free of visible dust, soiling, soap scum, mould/mildew and stains ➢ fixtures will be free of dust, soiling, soap scum, and stains ➢ cracked and/or broken tub will be reported for repair and/or replacement
Urinal & fixtures & exposed piping	➢ will be free of visible dust, soiling, and stains ➢ fixtures will be free of dust, soiling, and stains ➢ cracked or broken urinal will reported for replacement ➢ leaking fixtures will reported for repair and/or replacement
Vending machine	➢ will be free of visible dust and smudges
Vent and grille	➢ will be free of visible dust, and dust/spider webs
Vinyl board	➢ will be free of visible dust and smudge build-up
Wall – brick	➢ will be free of visible dust, soiling, marks, and dust/spider webs ➢ chips, cracks, and holes will be reported for repair and/or replacement
Wall – vinyl	➢ will be free of visible dust, soiling, marks, and dust/spider webs ➢ chips, cracks, and holes will be reported for repair and/or replacement
Wall – wood	➢ will be free of visible dust, soiling, marks, and dust/spider webs ➢ chips, cracks, and holes will be reported for repair and/or replacement
Wall – painted	➢ will be free of visible dust, soiling, marks, and dust/spider webs ➢ peeling paint, chips, cracks, and holes will be reported for repair
Wall – ceramic	➢ will be polished free of visible dust, soiling, marks, and dust/spider webs ➢ chips, cracks, and holes will be reported for repair and/or replacement
Wall – marble	➢ will be polished free of visible dust, soiling, marks, and dust/spider webs ➢ chips, cracks, and holes will be reported for repair and/or replacement

[Adapted from: Ontario Health-Care Housekeepers' Association Inc., '*Cleaning Standards for Health Care Facilities*'.[122] Revised March 2008]

Appendix D: Sample Environmental Cleaning Checklists and Audit Tools

CHECKLISTS

The use of checklists by staff when cleaning areas that require Hospital Clean 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.

Cleaning checklist #1 is a sample checklist for routine daily cleaning for a patient/resident room. The items in this list are compatible with the procedure listed in Box 15.

Cleaning checklist #2 is a sample checklist for terminal/discharge cleaning for a patient/resident room contaminated with VRE. The items in this list are compatible with the procedures listed in Box 30.

SAMPLE CLEANING CHECKLIST #1: Daily Routine Cleaning of a Patient/Resident Room:

- ☐ Check for Additional Precautions signs and follow the precautions indicated
- ☐ Walk through room to determine what needs to be replaced
- ☐ Ensure an adequate supply of clean cloths is available
- ☐ Prepare fresh disinfectant solution according to manufacturer's instructions
- ☐ Clean hands using ABHR and put on gloves
- ☐ Clean 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, glove box holder
- ☐ Check and remove fingerprints and soil from interior glass partitions, glass door panels, mirrors and windows with glass cleaner
- ☐ Check privacy curtains for visible soiling and replace if required
- ☐ Clean all furnishings and horizontal surfaces in the room including:
  - ☐ chairs
  - ☐ window sill
  - ☐ television and cords
  - ☐ telephone
  - ☐ computer keypads
  - ☐ night table and other tables or desks
- ☐ 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, including cord
- ☐ Clean bathroom/shower (**see bathroom cleaning procedure**)
- ☐ Clean floors (**see floor cleaning procedure**)
- ☐ Place soiled cloths in designated container for laundering
- ☐ Check sharps container and change when ¾ full (do not dust the top of a sharps container)
- ☐ Remove soiled linen if bag is full
- ☐ Place obvious waste in receptacles
- ☐ Remove waste
- ☐ Remove gloves and clean hands
- ☐ Replenish supplies as required (e.g., toilet paper, paper towel, soap, alcohol-based hand rub, gloves, sharps container)
- ☐ Replace privacy curtains
- ☐ Clean hands with ABHR on leaving the room

SAMPLE CLEANING CHECKLIST #2:
Discharge (Terminal) Cleaning of Contact Precautions Room for VRE

- ☐ Use a fresh bucket, cloth(s), mop head. Use each cloth one time only. **THERE IS TO BE NO RE-USE OF USED CLOTHS**
- ☐ Prepare fresh disinfectant according to manufacturer's instructions
- ☐ Clean hands using alcohol-based hand rub and put on gloves
- ☐ Remove all dirty/used items (e.g., suction container, disposable items)
- ☐ Remove curtains (privacy, window, shower)
- ☐ Remove dirty linen (sheets, towels); roll sheets carefully to prevent aerosols
- ☐ Discard soap, toilet paper, paper towels, glove box
- ☐ **Discard gloves, clean hands and apply clean gloves**
- ☐ Clean and disinfect all surfaces and allow for the appropriate contact time with the disinfectant:
  - ☐ doors, door handles, push plate and touched areas of frame
  - ☐ walls, if visibly soiled; remove tape from walls
  - ☐ light switches and thermostats
  - ☐ wall mounted items:
    - ☐ alcohol-based hand rub dispenser
    - ☐ soap dispenser
    - ☐ glove box holder
    - ☐ top of suction bottle
    - ☐ sharps container (sides and bottom)
    - ☐ blood pressure manometer (including cuff)
  - ☐ low level interior glass partitions, glass door panels, mirrors and windows
  - ☐ chairs
  - ☐ tables (bedside table, over bed table, desks)
  - ☐ window sill
  - ☐ television, including cords and remote control
  - ☐ telephone
  - ☐ computer keyboards
  - ☐ light cord
  - ☐ toys, electronic games (paediatrics)
  - ☐ wheelchair, walker
  - ☐ monitors
  - ☐ IV pole and pump
  - ☐ inside and outside of patient/resident cupboard or locker and inside drawers
  - ☐ commode
- ☐ Clean bed:
  - ☐ Check for cracks or holes in mattress and have mattress replaced as required
  - ☐ Clean the following, allowing for the appropriate contact time with the disinfectant:
    - ☐ top and sides of mattress, turn over and clean underside
    - ☐ exposed bed springs and frame, including casters
    - ☐ headboard and foot board
    - ☐ bed rails
    - ☐ call bell
    - ☐ bed controls
    - ☐ allow mattress to dry
- ☐ Clean bathroom/shower (**see bathroom cleaning procedure**)
    - ☐ discard toilet brush
- ☐ Clean floor (**see floor cleaning procedure**)
- ☐ Disposal:
  - ☐ remove and replace sharps container if ¾ full
  - ☐ remove soiled linen bag
  - ☐ remove waste
- ☐ **Remove gloves and clean hands**
- ☐ Remake bed
- ☐ Replace curtains
- ☐ Replenish supplies:
  - ☐ soap
  - ☐ toilet paper
  - ☐ paper towels
  - ☐ glove box
  - ☐ toilet brush
- ☐ Return cleaned equipment (e.g., IV poles and pumps, walkers, commodes) to clean storage room

AUDIT TOOLS

Audit tools are used by ES supervisors and managers, training staff and others involved in quality improvement relating to cleaning in health care 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 (see Section II - 8.3), 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.

Calculation of Compliance:

$$\frac{\textbf{Total number of 'Yes' responses}}{\textbf{Total number of 'Yes' and 'No' responses}} \times 100 = \textbf{compliance \%}$$

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.

The following is a sample audit tool for routine daily cleaning for a patient/resident room. The items in this list are compatible with the procedure listed in Box 15.

Sample Audit Tool for Routine Daily Patient Room Cleaning

Area Monitored	Compliance			Deficiency Noted
	Yes	No	N/A	
Supplies				
There is a one-day supply of toilet paper, paper towels, soap, ABHR, gloves				
The sharps container is less than 3/4 full				
Waste has been removed				
Soiled linen has been removed				
Surface Cleaning				
Doors, door handle, frame and push plate				
Walls (visible soiling)				
Curtains (visible soiling)				
Light switches				
Thermostat				
Wall mounted items (e.g., ABHR dispenser, glove box holder)				
Glass partitions, door panels, mirrors and windows				
Chairs				
Window sill				
Television plus cords				
Telephone				
Computer keypads				
Night table, overbed table, side tables, desks				
Top of suction bottles				
Blood pressure manometer				
IV poles				
Intercom				
Bedrails, bed controls				
Call bell and cord				
Mobile equipment (e.g., walker, wheelchair)				
Linen hamper (all surfaces)				
Bathroom Cleaning				
Mirror				
All dispensers and frames				
Chrome wall attachments				
Door handle and frame				
Light switch				
Wall mounted dispensing machines				
Call bell and cord				
Support railings				
Ledges, shelves				
Sink and faucets				
Shower, including faucets, shower head, soap dish, grout				
Toilet, including attached seats, handle, underside of flush rim				
Floor Cleaning				
Floors				
Carpets				
Compliance Rate				
Total number of 'Yes'				**Compliance Rate:**
Total number of 'No'				
Total number of items ('Yes' and 'No', exclude 'N/A')				

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) ▪ Noncritical equipment used for home health care 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	▪ Hydrotherapy tanks, exterior surfaces of dialysis equipment, cardiopulmonary training mannequin, environmental surfaces ▪ Noncritical equipment used for home health care ▪ Blood spills **<u>Dilution of Household Bleach</u>** <u>Undiluted: 5.25%</u> sodium hypochlorite, 50,000 ppm available chlorine <u>Blood spill – major</u>: dilute 1:10 with tap water to achieve 0.5% or 5,000 ppm chlorine <u>Blood spill – minor</u>: dilute 1:100 with tap water to achieve 0.05% or 500 ppm chlorine <u>Surface cleaning, soaking of items</u>:	▪ Low cost ▪ Rapid action ▪ Readily available in non hospital settings ▪ Sporicidal	▪ Corrosive to metals ▪ Inactivated by organic material; for blood spills, blood must be removed prior to disinfection ▪ Irritant to skin and mucous membranes ▪ Should be used immediately once diluted ▪ Use in well-ventilated areas ▪ Must 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
	dilute 1:50 with tap water to achieve 0.1% or 1,000 ppm chlorine [REF: Health Canada/PHAC: '*Hand Washing, Cleaning, disinfection and Sterilization in Health Care*'. Table 7, page 17]		
Accelerated Hydrogen Peroxide 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 aluminium
Accelerated Hydrogen Peroxide 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 aluminium, rubber, plastics ▪ Do not use on monitors
Hydrogen peroxide 3% (Non-antiseptic formulations)	▪ Noncritical equipment used for home health care ▪ 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	▪ Rapid action ▪ Non-toxic	▪ Corrosive to metal unless combined with inhibitors ▪ Inactivated by organic materials ▪ May stain fabrics and synthetic

Process Option	Uses/Comments	Advantages/Comments	Disadvantages/Comments
	poles, wheelchairs, beds, call bells) **DO NOT use antiseptic iodophors as hard surface disinfectants**		materials
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 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 disinfection	▪ 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 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 and Long-Term Care's '*Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings*'[17]]

Appendix F: Cleaning and Disinfection Decision Chart for Non-critical Equipment

The following chart relates to **non-critical patient care equipment** only, i.e., equipment that comes into contact with intact skin. For semi-critical and critical equipment that require high-level disinfection or sterilization, see the Ministry of Health and Long-term Care's '*Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings*'.[17]

Level of Cleaning and Disinfection	Classification of Equipment/ Device	Effective Products**
Cleaning Physical removal of soil, dust or foreign material. Chemical, thermal or mechanical aids may be used. Cleaning usually involves soap and water, detergents or enzymatic cleaners. Thorough cleaning is required before disinfection or sterilization may take place.	All reusable equipment/devices	**Concentration and contact time are dependent on manufacturer's instructions** ▪ Quaternary ammonium compounds (QUATs) ▪ Enzymatic cleaners ▪ Soap and water ▪ Detergents ▪ 0.5% Accelerated hydrogen peroxide
Low-Level Disinfection Level of disinfection required when processing noncritical equipment/devices or some environmental surfaces. Low-level disinfectants kill most vegetative bacteria and some fungi as well as enveloped (lipid) viruses. Low-level disinfectants do not kill mycobacteria or bacterial spores.	Non-critical equipment/devices	**Concentration and contact time are dependent on manufacturer's instructions** ▪ 3% Hydrogen peroxide (30 minutes) ▪ 70-95% Alcohol (10 minutes) ▪ Hypochlorite (1000 ppm) ▪ 0.5% Accelerated hydrogen peroxide (5 minutes) ▪ Quaternary ammonium compounds (QUATs) ▪ Iodophors ▪ Phenolics (should not be used in nurseries or equipment that comes into contact with infants such as scales)

Appendix G: Recommended Minimum Cleaning and Disinfection Level and Frequency for Non-critical Client/Patient/Resident 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. For semi-critical and critical equipment that require high level disinfection or sterilization, see the Ministry of Health and Long-term Care's '*Best Practices for Cleaning, Disinfection and Sterilization in All Health Care Settings*'. Refer to Appendix F for appropriate agents that may be used for cleaning and disinfection of non-critical patient care equipment.

This chart also includes **environmental surfaces and items** that do not come into contact with skin. Refer to Section III and Appendix E for guidance regarding cleaning and disinfection of environmental surfaces and items.

Article	Minimum Cleaning and Disinfection Level: CL = Clean only LLD = Clean + Low-Level Disinfectant	Minimum Frequency	Remarks
Airflow sensors (Sleep Lab)	LLD	▪ between patients	▪ clean with detergent and water before disinfection
Apnoea Monitor Monitor/Sensor Pad	LLD	▪ between patients and when soiled	
Arrest Cart	See Resuscitation Cart		
Bath Seat and Raised Toilet Seat Single patient use	LLD	▪ when soiled	▪ ideally dedicated to each patient
Multiple patient use	LLD	▪ between patients	
Bed Bedrail and extender	LLD	▪ daily	
Mattress	LLD	▪ clean between patients and when soiled	
Halo bed	LLD	▪ after each patient and when soiled	
Visitor cot	LLD	▪ change linen and clean between uses	
Bedpan and Urinal Single patient	CL	▪ clean after each use if designated to patient	▪ remove gross soil and fluids before cleaning

Article	Minimum Cleaning and Disinfection Level: CL = Clean only LLD = Clean + Low-Level Disinfectant	Minimum Frequency	Remarks
Between patients	LLD	▪ between patients	▪ remove gross soil and fluids before cleaning
Bladder Scanner	LLD	▪ between patients	
Blood Pressure Cuff	LLD	▪ between patients and when visibly soiled	▪ ideally stays with patient until discharge
Call Bell	LLD	▪ daily and between patients	
Cardiac Monitor	CL	▪ daily and between patients	
Cast cutting Blades	CL or disposable	▪ when soiled	▪ send for sterilization if soiled with blood or body fluids
Saws	CL	▪ when soiled	
Chair Includes recliners, patient chairs and shower chairs	LLD	▪ daily and when soiled	
Chart Cover Binder and/or clipboard	CL	▪ when soiled	▪ charts and clipboards are not to go into rooms on Additional Precautions ▪ replace worn binders
Clippers Surgical	LLD	▪ between patients	▪ disposable heads are preferred
Commode Chairs Single patient use	LLD	▪ when soiled	▪ ideally dedicated to each patient ▪ patients with VRE or *C.difficile* must have dedicated commode ▪ for *C.difficile*, consider cleaning with a sporicidal agent ▪ remove gross soil and fluids before cleaning and disinfection
Multiple patient use	LLD	▪ when soiled ▪ between patients	▪ remove gross soil and fluids before cleaning and disinfection
Cyclers (Peritoneal Dialysis)	CL	▪ between patients	

Article	Minimum Cleaning and Disinfection Level: CL = Clean only LLD = Clean + Low-Level Disinfectant	Minimum Frequency	Remarks
Defibrillator	See Resuscitation Cart		
Diagnostic Imaging Portable - Machine	CL	▪ when soiled and on leaving Contact Precautions room	
Portable - portable grid/ film cassette	LLD	▪ between patients if not covered	▪ ideally should be covered (e.g., pillowcase)
Mammography - paddles	LLD	▪ between patients	
Dopplers Transducers	CL	▪ after each use	▪ wipe immediately after use to remove residual ultrasound gel before cleaning
Probes	LLD	▪ after each use	▪ probes that contact mucous membranes or non-intact skin require high-level disinfection
ECG Machine and Cables	CL	▪ between patients	
Electric Razor Razor body and Handle	CL	▪ as required	▪ must be single patient use
Examination Table	LLD	▪ between patients and when soiled	
Glucometer	LLD	▪ after each use	
Halo Bed	See Bed		
Hydraulic Lift Machine	CL	▪ as required	
Sling	CL	▪ between patients and when soiled	▪ dedicated to patient if possible ▪ launder if visibly soiled
Ice Machine Interior	LLD	▪ every 6 months	▪ drain and thoroughly clean with a de-limer
Exterior	CL	▪ every 3 days	
Intravenous (IV) Pumps, Poles, Warmers	LLD	▪ between patients and when soiled	

Article	Minimum Cleaning and Disinfection Level: CL = Clean only LLD = Clean + Low-Level Disinfectant	Minimum Frequency	Remarks
Laryngoscope Handle	CL	▪ between patients	▪ laryngoscope blade requires high-level disinfection after each use
Mattress	See Bed		
Measuring Container (urine) Single patient use	CL	▪ after each use	
Multiple patient use	LLD	▪ after each use	▪ one container per patient, labelled with name
Ophthalmoscope	CL	▪ between patients	
Otoscope Handle	CL	▪ between patients	▪ use disposable ear specula or high-level disinfection
Orthopedic Equipment Crutches, traction etc.	CL	▪ between patients	
Oximeter Probes	LLD	▪ daily and between patients	▪ refer to manufacturer's instructions for cleaning
Pillow	LLD	▪ between patients and when soiled	▪ discard if cracked
Reflex Hammer	CL	▪ between patients	
Restraints	CL or disposable	▪ between patients and when soiled	
Resuscitation Cart/Arrest Cart	CL	▪ weekly and after use	▪ avoid taking cart into Contact Precautions room, have a designated clean person to pass supplies as required
Defibrillator	LLD	▪ after each use	
Supplies/Trays	CL	▪ after each use	▪ all items taken into Contact Precautions room must be discarded and not returned to the cart, even if unopened
Scales Adult	CL	▪ daily and when soiled	

Article	Minimum Cleaning and Disinfection Level: CL = Clean only LLD = Clean + Low-Level Disinfectant	Minimum Frequency	Remarks
Diaper	LLD	▪ after each use	
Infant/Neonate	LLD	▪ after each use	▪ do not use phenolics
Stretcher	LLD	▪ after each use	
Stethoscope	LLD	▪ after each use	▪ ideally use own stethoscope ▪ if shared, disinfect ear pieces
Suction Machines	LLD	▪ when soiled ▪ between patients	
Table Bedside Over bed	LLD	▪ daily ▪ when soiled ▪ between patients	
Telemetry Equipment Monitor and Cables	CL	▪ between patients ▪ when soiled	
Tourniquet	CL	▪ between patients or disposable	▪ discard when soiled
Transfer Boards	LLD	▪ between patients ▪ when soiled	
Transport Equipment Walker Wheelchair	LLD	▪ after each use	
Tub Bath board	LLD	▪ after each use	▪ Iodine and chlorine products may damage tub surfaces
Ultrasound Transducers Handle and Cable External	LLD	▪ between patients	▪ use high-level disinfection for transducer probes
Urinal	See Bedpan		
Urine Measuring Container	See Measuring Container		
Vacutainer Holder	CL	▪ when soiled	▪ ideally, single patient use ▪ discard if visibly soiled
Walker	See Transport Equipment		

Article	Minimum Cleaning and Disinfection Level: CL = Clean only LLD = Clean + Low-Level Disinfectant	Minimum Frequency	Remarks
Wall-mounted Oxygen and Suction Fixtures	CL	▪ between patients ▪ when soiled	
Water Jug	CL	▪ daily	
Wheelchair	See Transport Equipment		

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