

- b) in-room workstations and/or central "hubs" for reporting, etc., shall be accommodated;
- c) respiratory therapy services shall be provided according to a hub-and-satellite approach, including a central hub, which includes the main staff work area, offices, assembly, testing, storage, etc., and potential satellite locations in the surgical suite, critical care units, maternal and newborn, and emergency; and
- d) all satellite locations should also include work areas, cleaning, processing, assembly, testing, and storage as required.

### **9.10.2.3 Support service delivery**

The following provisions shall apply:

- a) the flow of patients shall, as much as possible, be separate from the flow of materials;
- b) the space for receiving and cleaning soiled materials shall be physically separated from the space for storage of clean equipment and supplies; and
- c) appropriate local exhaust ventilation shall be provided if glutaraldehyde or other noxious disinfectants are used in the cleaning process.

### **9.10.3 Technical requirements**

#### **9.10.3.1 Locations for cough-inducing and aerosol-generating procedures**

The following provisions shall apply:

- a) All cough-inducing procedures performed on patients who are suspected of having infectious Mycobacterium tuberculosis shall be performed in rooms using local exhaust ventilation devices (e.g., booths or special enclosures that have discharge HEPA filters and exhaust directly to the outside).
- b) If a ventilated booth is used, the air exchange rate within the booth shall be at least 12 air changes per hour, with a minimum exhaust flow rate of 50 CFM and differential pressure of 2.5 Pa.
- c) These procedures may also be performed in a room that meets the ventilation requirements for airborne infection control as specified in CAN/CSA Z317.2.

#### **9.10.3.2 Hyperbaric therapy services**

The following provisions shall apply:

- a) hyperbaric service areas shall be designed in accordance with Z275.1;
- b) the design shall be based on the access required by the patient population for specific hyperbaric treatment modalities;
- c) space requirements will depend on the volume and scope of services offered by individual HCFs; and
- d) the hyperbaric services area shall be conveniently located to emergency care.

*Note: Additional information can be found through the Undersea and Hyperbaric Medical Society (UHMS).*

### **9.10.4 Space details**

Table 9.9 presents the standard requirements for key spaces within respiratory services area. Common areas are detailed in Clause 11.

**Table 9.9**  
**Key space requirements and recommendations — Respiratory services**  
(See Clause 9.10.4.)

Item no.	Room names	Net area, m <sup>2</sup>	Requirements and recommendations
1	PFT room	14.0	<p>See Table 11.1, Item 14 for common requirements and recommendations for an examination/procedure/treatment room.</p> <p><b>Mandatory:</b> Good air exchanges shall be provided, as there will be nebulized aerosols in these rooms.</p> <p><b>Advisory:</b> Some older equipment can be larger and require a larger room area.</p>
2	Spirometry/ ABG	12.0	<p>See Table 11.1, Item 14 for common requirements and recommendations for an examination/procedure/treatment room.</p> <p><b>Mandatory:</b> Good air exchanges shall be provided, as there will be nebulized aerosols in these rooms.</p>
3	Preparation room	7.5	<p>See Table 11.1, Item 14 for common requirements and recommendations for an examination/procedure/treatment room.</p> <p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The prep room shall be located near EEG, EMG, EVP, and sleep rooms.</li> <li>b) There shall be one prep room for every three sleep rooms.</li> </ul> <p><b>Advisory:</b> Locations for leads for all modalities requiring them should be considered.</p>
4	Technologist/ physician review/quality assessment workstation	Varies, 4.6 for each worksta- tion and additional circulation space	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Special care shall be taken for lighting systems.</li> <li>b) Dimming of indirect fixtures shall be provided.</li> <li>c) Black baffles shall be provided on downlights.</li> <li>d) The room light shall match monitor brightness.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) There may be a number of these workstations — for review of tests and quality control — in one room, based on departmental volumes.</li> <li>b) Consideration should be given to decentralizing review workstations to test modality areas, based on departmental volumes and configuration.</li> </ul>
5	6-min walk test location	Varies; assume patients use existing hallways/ routes	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The test area shall be comprised of a convenient and measurable route away from a main public circulation corridor.</li> <li>b) The area shall be near the respiratory therapy department.</li> <li>c) Patient handrails shall be provided.</li> <li>d) Flooring shall comply with Clauses 7.2.2.4 and 12.2.5.2. Carpeting shall not be used.</li> </ul> <p><b>Advisory:</b></p>

(Continued)

**Table 9.9 (Concluded)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
The area may be located in a suitable physiotherapy gym, if one is available.			
6	Central respiratory therapy holding/receiving equipment	Varies; based on devices expected	<p>See Table 11.1, Item 45 for common requirements and recommendations for a storage room.</p> <p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The room shall be in a core/central location, as it functions as a large storeroom and assembly room for spare equipment.</li> <li>b) Medical gases shall be provided, including oxygen and medical air.</li> </ul> <p><b>Advisory:</b></p> <p>Portions may be distributed to satellite respiratory therapy facilities and may be collocated with cleaning and preventive maintenance.</p>
7	Central RT preventative maintenance	Varies; ensure 4.6 for each workstation, equipment holding area and additional circulation space	<p>See Table 11.1, Item 38 for common requirements and recommendations for a respiratory therapy/anaesthesia support area.</p> <p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Good lighting shall be provided.</li> <li>b) A stainless steel workbench shall be provided.</li> <li>c) Finishes shall be cleanable.</li> <li>d) A bench for testing equipment shall be provided.</li> </ul>
8	Satellite RT facilities	Varies; ensure 4.6 for each workstation and additional circulation space	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Facilities shall be comprised of a workstation, preventative maintenance area, and storage.</li> <li>b) If any reprocessing of equipment is required, it shall be sent to MDRD.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Workstation and storage can be collocated.</li> <li>b) Depending on volumes, satellite respiratory therapy facilities may be located in the surgical suite, critical care, maternal and newborn/NICU, and emergency.</li> </ul>

## 9.11 Medical imaging services

The requirements specific to this service shall comply with 9.11. See Clauses 9.1, 9.2, and 9.3 for additional information.

### 9.11.1 Description and application

#### 9.11.1.1

Medical imaging provides diagnostic testing for inpatients, outpatients, and emergency patients with a variety of modalities and technologies in order to support the assessment and determine the diagnosis of patients. Medical imaging may also be used for treatment, including interventions. Services may be provided in a HCF to support in-centre services, as part of an ambulatory care centre, or as a stand-alone diagnostic service to support referrals in the community.

The services provided by medical imaging may include

- a) radiography (including general radiography, tomography, and fluoroscopy);
- b) ultrasonography;
- c) nuclear medicine (including bone mineral densitometry);
- d) mammography (diagnostic and screening);
- e) computerized tomography (CT);
- f) magnetic resonance imaging (MRI);
- g) interventional/angiography;
- h) PET/CT (positron emission tomography);
- i) single photon emission computed tomography (SPECT); and
- j) portable imaging.

### **9.11.1.2**

HCFs providing medical imaging services shall comply with Clauses 9.1 and 9.10. Ambulatory facilities shall also comply with Clause 9.2. If the medical imaging procedures involve activities in Category III, the HCF shall comply with Clause 9.3.

## **9.11.2 Functional requirements**

### **9.11.2.1 Patient management**

Patient management provisions in medical imaging services shall include the following:

- a) The service shall be designed to allow triage of infectious versus non-infectious patients at the entrance.
- b) In a HCF with inpatient beds, inpatients shall be escorted directly to a procedure room or a separate waiting/holding area.
- c) The service shall be designed to facilitate isolation of infectious patients (e.g., through the use of separation bay(s) in the stretcher waiting, holding, preparation, and recovery areas).
- d) The information and control desk for outpatients shall be easily visible and set up so that staff can direct visitors to specific treatment areas/spaces. The electronic imaging management area shall be close to reception or public access.
- e) Access to patient washrooms and change rooms shall be provided for each treatment area/space.
- f) Patient washrooms shall have an emergency call system. Call systems shall be provided in other areas according to need.
- g) Change rooms and gowned waiting areas shall be close to their respective treatment spaces so that patients do not enter public spaces and can maintain privacy when wearing gowns.
- h) Separate waiting areas, change rooms, and washrooms shall be provided for nuclear medicine.

**Notes:**

- 1) *Outpatients in medical imaging services can be scheduled or walk-in, depending on the procedure. Patients are sometimes referred from another care provider.*
- 2) *Patients in this service are generally received centrally, then proceed to decentralized sub-waiting areas for specific services.*

### **9.11.2.2 Workflow**

Workflow design in medical imaging services shall include the following provisions:

- a) Upper and lower gastro-intestinal (GI) procedures may be performed in separate fluoroscopy rooms.
- b) Patient tracking systems may be used to support patient care management.
- c) Provisions shall be made for staff and patient entrances from separate corridors.
- d) Patient holding/recovery areas shall be under staff control.

- e) Images shall be captured digitally or by computed radiography and shall be archived into a picture archiving and communications system (PACS).
- f) Workstations shall ensure quality control by technologists and sonographers.
- g) Images shall be interpreted in a quiet reading area, optimized for reading digital images.
- h) Access to staff facilities shall be provided for staff use.
- i) There shall be separation of patient access and staff access to the services within the department.

### **9.11.2.3 Support service delivery**

The design of support services in medical imaging services shall include the following:

- a) Storage space for medical equipment, sterile supplies, medical/surgical supplies, office supplies, linens, pharmaceuticals, and narcotics shall be provided.
- b) Separate provisions shall be made for contaminated handling and holding of soiled goods, including radioisotopes and radioactive wastes.
- c) Hand wash, eyewash, and shower stations shall be provided.
- d) Provision shall be made for high-level disinfection of transducers.
- e) Lifting and transfer devices might be needed.

### **9.11.3 Technical requirements**

#### **9.11.3.1 General**

##### **9.11.3.1.1**

The design of diagnostic imaging services shall include the following provisions:

- a) Mechanical systems, electrical rooms, and elevators that are in close proximity to imaging equipment shall be reviewed for their potential interference.  
*Note: Much of the equipment in diagnostic imaging is sensitive to vibration. This is particularly important in multi-slice CT suites and MRI suites.*
- b) In areas where interventional procedures will be undertaken, air exchanges shall be provided in accordance with infection prevention and control and mechanical requirements.
- c) MRI, CT, and PET/CT and special filtration of water sources or a closed-loop system shall be provided when connected to imaging equipment, in accordance with the manufacturer's requirements.  
*Note: Water quality is extremely important for water-chilled equipment.*
- d) Provisions for ceiling mounted equipment shall be incorporated in accordance with the equipment manufacturer's specifications.
- e) Windows shall not be provided in ultrasound, X-ray, fluoroscopy, mammography, and angiography rooms or in radiologists' reading/interpretation areas.
- f) There shall be separate heating and cooling zones for the equipment and controls.
- g) Structural design shall be aware of the floor loading of equipment.
- h) Space for the diagnostic imaging transformer shall be allocated adjacent to or within the program area.
- i) A strategy to allow for installation of cabling, shielding, and piping during the initial equipment installation and for future equipment installation shall be incorporated.
- j) Radiology rooms shall be designed in accordance with applicable requirements.  
*Note: See the Government of Ontario's X-ray Safety Code.*
- k) The nuclear medicine services shall be designed in accordance with applicable requirements.  
*Note: In Canada, the following document applies: Canadian Nuclear Safety Commission/Atomic Energy Control Board Regulatory Document GD-52.*

- i) MRI facilities shall be designed in accordance with the National Alliance of Respiratory Therapy Regulatory Bodies' *White Paper on Magnetic Resonance (MR) Safety: Combined Papers 2002 and 2004*.
- m) Images shall be interpreted in a quiet reading area, optimized for reading digital images.
- n) MRI scan rooms shall be equipped with a strobe light fire alarm notification device.
- o) MRI scan room air shall have an oxygen monitor content to detect reductions in room oxygen levels due to helium content increasing.
- p) MRI scan rooms shall have an emergency air exhaust system that is activated by the oxygen monitors.
- q) MRI scan room RF shielding designs for a shielded room within a facility's building room shall meet applicable requirements for seismic restraining.

**Note:** Building code requirements can apply to the shielding design. Provincial/territorial regulations can apply to the qualifications of the engineer who designs the shielding.

#### 9.11.3.1.2

The design for imaging areas should include sufficient space for

- a) the movement of stretchers; and
- b) the shifting of equipment (if applicable) to allow scanning from the patient's left and right sides.

Sufficient space should also be provided in washrooms to allow transfers.

#### 9.11.3.2 Special workspace provisions

The organization of the medical imaging areas shall be as follows:

- a) The MRI and prep area shall be within a secure location (change rooms, patient prep area, interview room, sub-waiting, and MRI forming a MRI suite).
- b) The patient prep and sub waiting areas shall be beside CT.
- c) There shall be a barium prep area adjacent to the fluoroscopy room.
- d) Separate waiting areas, change rooms, and washrooms shall be provided for nuclear medicine.
- e) An injection room shall be provided adjacent to the nuclear gamma camera room and the SPECT-CT room.
- f) There shall be a stress test area adjacent to the nuclear gamma camera room.
- g) Decentralized radiologists' reading/interpretation areas shall be provided for the various modalities. Diagnostic image viewing workstation, if provided, shall comply with Table 11.1, Item 11.
- h) The design may include sharing of patient recovery areas to facilitate nursing coverage.

#### 9.11.3.3 Radiation protection

A qualified physicist or radiation specialist shall be used to specify the type, location, and amount of radiation protection required in accordance with the final equipment selection and layout.

Where protected alcoves with view windows are required, a minimum of 1.07 m shall be provided between the exposure control and the outside partition edge.

Radiation protection requirements shall be incorporated into the specifications and the building plans.

**Note:** Most imaging equipment and processes require radiation protection.

### 9.11.3.4 Acoustics

#### 9.11.3.4.1

Acoustic privacy shall be provided in all imaging rooms, interview rooms, and reporting areas.

#### 9.11.3.4.2

An acoustic study shall be completed in all MRI suite designs.

**Note:** *MRI scanners and compressors can introduce higher-than-normal noise levels into clinical areas.*

### 9.11.3.5 Internal design

The following provisions shall apply to all medical imaging areas:

- a) Surface colours shall be compatible with the low lighting levels required for PACS/image viewing.
- b) Material shall be durable and resistant to impact (this area can be subject to significant stretcher traffic).
- c) Doors shall include frame guards to protect against bumping and impact of stretchers and other mobility aids.

### 9.11.3.6 Infection prevention and control

In addition to the general list of infection prevention and control requirements, the following provisions shall be made in medical imaging areas:

- a) An area for segregation of patients requiring airborne precautions shall be provided.
- b) Hand hygiene stations shall be distributed throughout the services
  - i) at point of contact with patient;
  - ii) at entry/exit to/from patient rooms and in all procedure rooms; and
  - iii) in areas where operative procedures are performed;
- c) Where high-risk invasive procedures are anticipated, scrub sinks shall be provided directly outside the staff entry to the procedure room.
- d) In order to meet radioactivity standards, special sink materials and specifications should be followed. Stainless steel and hands free operable controls shall be provided for hand hygiene sinks in areas handling radioactive materials.

**Note:** *See Regulatory Document GD-52.*

- e) Provision for storing of soiled reusable medical devices (e.g., ultrasound probes) shall be provided. Clean and soiled areas of disinfection and sterilization shall be physically separated from each other in compliance with CAN/CSA-Z314.
- f) Decontamination and sterilization shall take place within the MDRD or in an area that meets the requirements of CAN/CSA-Z314.
- g) Clean supplies, including those on carts, shall not be stored in hallways.
- h) Local access to washrooms and bedpan disposal shall be determined in accordance with the ICRA.

### 9.11.3.7 Materials and finishes

#### 9.11.3.7.1

In addition to the general materials and finishes requirements, the following provisions shall be made in medical imaging areas:

- a) Noise transmission control measures should be provided.

**Note:** *Acoustic damping of walls, floors, and ceilings softens the environment and provides an extra measure of comfort.*

- b) Copper- or lead-lined components shall be used where needed for radiation protection. Lining requirements shall be reviewed and approved by a qualified radiation specialist.
- c) Magnetic shielding shall be used where required to restrict the magnetic field plot.
- d) Radio frequency shielding shall be used where required to attenuate stray radio frequencies.

#### **9.11.3.7.2**

The area around, above, and below an MRI suite shall be reviewed and evaluated for the following:

- a) possible occupancy by person(s) who could have pacemakers or other metal implants; and
- b) equipment that can be disrupted by a magnetic field (e.g., personal computers, monitors, CT scanners, and nuclear cameras).

After reviewing and evaluating the surrounding space, appropriate magnetic shielding shall be provided.

#### **9.11.3.8 Functional and storage space**

Functional and storage space shall be provided for the following:

- a) chemicals used in the unit;
- b) patient handling devices; and
- c) sharps disposal containers.

Eyewash facilities shall be provided when chemicals are being used.

#### **9.11.3.9 Technology considerations**

In addition to the general technology and communication requirements, the following provisions shall be made in this service:

- a) Provision shall be made for the use of voice-recognition software for dictation (to be saved directly to electronic health records).
- b) Additional communications systems and equipment that should be provided include
  - i) hands-free intercom;
  - ii) wireless earpieces for booking clerks;
  - iii) voice recognition dictation system over the HCF network for patient records and clinical studies;
  - iv) document scanners; and
  - v) film digitizers.

#### **9.11.4 Space details**

Table 9.10 presents the standard requirements for key spaces in the medical imaging area. Common areas are detailed in Clause 11.

**Table 9.10**  
**Key space requirements and recommendations — Medical imaging**  
(See Clause 9.11.4.)

Item no.	Room names	Net area, m <sup>2</sup>	Requirements and recommendations
1	Radiography room	29.0	<p>See Table 11.1, Item 14 for common requirements and recommendations for an examination/procedure/treatment room.</p> <p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The room shall have lead lining.</li> <li>b) There shall be a lead glass window between the control room and the radiology room to provide clear view of patient.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Equipment should be assessed before setting size.</li> <li>b) Same handedness in multiple radiology rooms should be applied to design.</li> </ul>
2	Control room (applies to Items 3 and 4)	Varies; 7.5	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The following shall be provided: <ul style="list-style-type: none"> <li>i) a standing-height counter;</li> <li>ii) sufficient space to accommodate equipment and infrastructure;</li> <li>iii) a hand hygiene sink at the entrance;</li> <li>iv) lead lining;</li> <li>v) a lead glass window between the control room and the radiology room to provide a clear view of patient; and</li> <li>vi) cabinet for storage for PPE.</li> </ul> </li> <li>b) The control room shall be accessible.</li> </ul> <p><b>Advisory:</b> A shared control room should be used.</p>
3	Dedicated chest room, including control room	22.0	<p><b>Mandatory:</b> If a 3050 mm focal receptor distance is required, the room shall be 610 mm longer.</p>
4	Fluoroscopy room, including control room		<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The barium prep area shall be located directly adjacent to the staff work area.</li> <li>b) Washrooms shall include <ul style="list-style-type: none"> <li>i) direct access;</li> <li>ii) sufficient space to accommodate two doors; and</li> <li>iii) direct access to bedpan disinfection facilities.</li> </ul> </li> <li>c) The room shall have a lead-lined enclosure.</li> </ul>
	Room	29.0	
	Control room	7.5	
	Washroom	4.6	<p><b>Advisory:</b> If there are multiple rooms, they should be designed with the same floor and plan and orientation.</p>
5	Ultrasound room	13.0	<p><b>Mandatory:</b> There shall be direct access to a washroom.</p> <p><b>Advisory:</b></p>

(Continued)

**Table 9.10 (Continued)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
For interventional ultrasound, a minimum area of 17.0 m <sup>2</sup> should be provided.			
6	CT and PET/CT room, including control room, washroom		<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) There shall be a direct line of sight (on a slight angle of approximately 25°) from the control room into the bore of the CT room.</li> <li>b) A ceiling-mounted injector shall be located on the side of the room with supply counters.</li> <li>c) There shall be direct access from the control room into the CT room.</li> <li>d) There shall be separate corridor access into control room.</li> <li>e) There shall be direct access to the washroom from the CT room.</li> <li>f) The CT room and control room shall have lead lining.</li> <li>g) Medical gases shall be provided in CT. These shall be positioned so that they are on the opposite side of the OR table from the patient entry door into the room.</li> </ul>
7	Angiography, including control room, computer room		<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The room environment shall use same standards as an operating room (i.e., mechanical systems standards).</li> <li>b) Emergency power, full UPS, and emergency lighting shall be provided as specified in CSA C282 and CSA Z32.</li> <li>c) The room shall have lead lining.</li> </ul>
	Room	40.0	
	Control room	11.0	
	Washroom (2-piece)	4.6	
7	Computer / equipment room		<p><b>Advisory:</b></p> <p>Design may include a two-piece washroom (4.6 m<sup>2</sup>).</p>
8	MRI 1.5/3.0 tesla, including control room, MRI equipment room		<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Planning and design shall include a patient hall or transition space to manage patient transfers and to create allowance for the five-c line.</li> <li>b) There shall be a desk height counter in the control room.</li> <li>c) The five-gauss line shall be contained either with room configuration or with the use of magnetic shielding.</li> <li>d) RF and magnetic shielding shall be provided.</li> <li>e) Allowance shall be made for cryogen venting to exit the facility to a safe location.</li> <li>f) A dedicated cooling system shall be provided for the computer room with an automatic emergency backup.</li> <li>g) A back-up system for the MRI scanner's cryogenic helium cooling system shall be provided.</li> <li>h) DC incandescent lights shall be used within the MRI room.</li> <li>i) Non-ferrous materials only shall be used within the MRI room.</li> <li>j) Non-ferrous materials only shall be used in the ceiling system support grids.</li> </ul> <p><b>Note:</b> Stainless steel, copper, wood, and aluminum may be used. Refer to national and local building codes for seismic and combustible contents.</p>
	Room	50.0	
	Control room	14.0	
	Equipment computer room (1.5 tesla)	17.7	
			<ul style="list-style-type: none"> <li>k) Medical gases shall be provided in MRI.</li> </ul>

*(Continued)*

**Table 9.10 (Concluded)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p>I) Positioning of the anaesthetic medical gases shall be in such a way that they are on the opposite side of the OR table from the patient entry door into the room.</p> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Additional provisions should be made in the structure design to support heavy loads of MR magnets (includes room and path of travel for moving the magnet from the exterior of the building to the final magnet location).</li> <li>b) Other adjustments might be needed to accommodate special patient needs (e.g., bariatric).</li> <li>c) Prior to planning, new MRI scanner installations location vibration and magnetic influence testing should be conducted at the planned installation location.</li> <li>d) During design of a new MRI installation, an area for helium "dewar" storage and transport to the MRI should be planned for.</li> </ul>
9	Nuclear medicine (excluding control room)	39.5	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The room shall have lead lining.</li> <li>b) The room shall be adjacent to the stress testing room for nuclear cardiology studies.</li> </ul>
9	Nuclear medicine - control room	11.0	
10	Mammography room	14.0	<p><b>Mandatory:</b> There shall be direct access to a washroom.</p>
11	Bone mineral densitometry	11.1	

## 9.12 Clinical laboratory

### 9.12.1 Description

#### 9.12.1.1

The clinical laboratory services (medical lab) provides testing on a variety of specimens to support the diagnosis, treatment, monitoring, and wellness assessment of patients.

#### 9.12.1.2

Clinical laboratories, whether within or outside of a hospital setting, can provide a range of services, as outlined in the following list. The actual service offerings of the medical laboratory shall be determined through the activities and needs of the HCF as documented in the functional program. The services provided include

- a) central processing/referral and receiving;
- b) chemistry;
- c) urinalysis;
- d) point-of-care testing;
- e) pathologist consultation;

- f) haematology;
- g) coagulation;
- h) transfusion medicine;
- i) morgue.
- j) microbiology, including virology;
- k) histology;
- l) cytology;
- m) autopsy;
- n) special biochemistry/immunology;
- o) specimen procurement/phlebotomy — inpatient (can also be part of ambulatory care);
- p) specimen procurement/phlebotomy — outpatient (can also be part of ambulatory care);
- q) parasitology;
- r) mycology;
- s) molecular genetics;
- t) flow cytometry;
- u) molecular pathology;
- v) cytogenetics; and
- w) molecular diagnostics.

### 9.12.1.3

Services can be provided by some laboratory departments within an ambulatory care centre (including facilities located within rental or commercial properties). Services can also be provided in a centralized area or be decentralized. Depending on local conditions and clinical services provided within the centre, laboratory services may include services listed in Clause 9.12.1.2.

## 9.12.2 Functional requirements

### 9.12.2.1 Patient management process

The following principles related to patient management are standard for all laboratory departments and shall be included in planning and design for laboratories:

- a) The privacy of patient specimens/information shall be maintained.
- b) The lab and receiving area shall be secure and not accessible to patients.
- c) Procurement of blood specimens, if done in proximity to the main laboratory, shall occur in a separate area so that the safety and security of the laboratory itself is preserved.

### 9.12.2.2 Workflow

Planning and design of laboratories shall include the following provisions:

**Notes:**

- 1) *The requirements in the following list may be adapted as needed to fit the particular situation of a smaller clinical laboratory, based on a risk assessment of the proposed alternative solution.*
- 2) *In general, the workflow of a medical laboratory is as follows:*
  - a) *All specimens are delivered directly to a central receiving area and marked with a unique identifier (e.g., bar code).*
  - b) *Specimens are sorted and sent to the appropriate station for testing.*
  - c) *Specimens are stored for an appropriate amount of time after testing.*
  - d) *The central receiving area can include a stat receiving area for specimens.*
  - e) *Certain specimens can be centrifuged and separated in the central receiving area prior to testing.*
- a) There shall be an appropriate holding area for specimens that will be sent to another site for testing, and for specimens received after hours.

- b) The receiving area shall have space for the electronic identification system used (e.g., bar code reader).
  - c) There should be an electronic system for reporting of results. The reporting system shall be able to provide results and communicate them to clinical areas in a timely manner.
  - d) Transportation and storage of all blood and blood products shall conform to applicable requirements and guidelines.
- Note:** *In Canada, federal regulations and Canadian Blood Services guidelines apply.*
- e) Planning shall take into account point of care testing (POCT) as it can affect throughput and maintenance needs, as well as staffing and space requirements.
  - f) The laboratory shall be located close to the critical care and emergency units for urgent tests and blood products.

**Notes:**

- 1) *Close proximity is not required if point of care testing is primarily used in those services, or if a rapid automated delivery system (e.g., a pneumatic tube system) is available.*
- 2) *In addition to providing flexibility in the location of the laboratory, pneumatic tube systems can reduce the need to provide regular courier services between the units. When reviewing the need to incorporate pneumatic tubes, the planning team should analyze the capital cost versus recurrent costs, as well as the clinical need for such a system.*
- g) Hand hygiene sinks shall be provided at the entrances and exits to the laboratory and shall be distributed throughout the department.
- h) Provision shall be made for a clean space with a hand hygiene sink in the phlebotomy area for the preparation of trays and storage of phlebotomy carts. An eyewash station should be included in phlebotomy areas where specimen procurement occurs.
- i) Workflow, tasks and equipment should be mapped to provide the optimal layout such that manual handling of supplies, specimens and shipments is avoided.
- j) For entry and waiting areas,
  - i) the reception or control desk shall be located at the front of the lab;
  - ii) there should be direct access to each of the collection and pick-up areas; and
  - iii) administrative offices may be included.
- k) Specimens in central receiving shall be handled in biosafety cabinets as required (e.g., for poorly packaged, damaged specimens — pre-processing of urine specimens, etc.).
- l) The decision on biosafety measures, such as a biosafety cabinet, shall be determined through a risk analysis.

### 9.12.2.3 Support service delivery

The following principles related to support services delivery shall be included in planning and design for laboratories:

- a) An electronic laboratory information system (LIS) shall be integrated with the HCF's information system for test order entry and reporting.
- b) Appropriate storage shall be provided for general supplies and bulk reagents in materials management.
- c) A housekeeping closet shall be equipped with a service sink or floor receptor and large enough to accommodate equipment and supplies.
- d) Provision shall be made for biohazard materials storage prior to pick-up and disposal.
- e) Hand hygiene sinks, eyewash stations, and safety showers shall be provided.

- f) A strategy for waste materials, such as biohazard materials, shall be developed in order to comply with all applicable requirements. This strategy should be reflected in the functional program and operational requirements for the HCF.

**Note:** Refer to CSA Z317.10, the federal biohazard waste guideline, and provincial/territorial and local regulations for hazardous waste disposal.

- g) Support requirements shall include

- i) storage area for general supplies and reagents;
- ii) biohazard storage area;
- iii) meeting and teaching room;
- iv) staff area (lockers, toilet facilities); and
- v) support areas (housekeeping).

Depending on HCF activities, hours of operation, and need, the HCF should provide a staff rest area, lunch room, or break room for after-hours staff.

The laboratory shall be equipped with piped compressed gases in accordance with its planned activities, as well as a dedicated vacuum/suction system. See CSA Z7396.1 where such gases are intended to be used directly and exclusively for patient care.

### 9.12.3 Technical requirements

#### 9.12.3.1 General

The criteria for location, adjacencies, and internal organization are standard for all laboratory departments and the requirements in Clause 9.12.3 shall be incorporated into planning and design.

#### 9.12.3.2 Services

Laboratory design shall take into account the need for utility connections for specific equipment (e.g., for water supply, purified water supply, and draining).

#### 9.12.3.3 Containment

The laboratory design shall include provisions for containment in areas where spill could endanger staff or patients. There shall be an ability to create containment areas in emergencies.

#### 9.12.3.4 Classification

The clinical laboratory shall be designed to meet applicable requirements and the biosafety requirements in accordance with its classification.

**Notes:**

- 1) In Canada, clinical laboratories are classified based on the risks associated with different levels of infectious micro-organisms. A containment level 3 (CL 3 lab) is certified and managed through PHAC and the Canadian Food Inspection Agency (CFIA). Labs dealing with Risk Group 2 and Risk Group 3 agents would have to have a license in addition to any P/T licensing requirements.
- 2) Requirements and guidance on biosafety are provided in the Canadian Biosafety Standard and Canadian Biosafety Handbook.

#### 9.12.3.5 Location

Laboratories shall be located to ensure timely and efficient transport of specimens from the point of collection to the laboratory. Laboratories should be located on or above grade.

**Notes:**

- 1) Laboratory location can be more flexible if there is a pneumatic tube system to patient care areas.

- 2) *Laboratory location can be subject to provincial/territorial or local fire regulations if certain limits for the below-grade storage of flammable liquids (e.g., alcohol) would be exceeded.*

### **9.12.3.6 Adjacencies**

#### **9.12.3.6.1**

The following requirements and recommendations shall apply to the location of laboratories:

- a) Histology/cytology shall be in close proximity to the surgical suite (if possible).
 

**Note:** *In some HCFs, the surgical staff could need to do frozen section and preliminary diagnosis. Pneumatic tubes can mitigate timing or location issues, or the HCF could have a satellite unit in the OR. The solution that is chosen should focus on the intent: timely tests and results for ORs.*
- b) Outpatient collection should be convenient to outpatient clinics.
- c) Morgue/autopsy shall be immediately accessible to a non-public exterior entrance for transfers of bodies.

#### **9.12.3.6.2**

The following services and departments shall have a convenient connection to the laboratory through non-public corridors:

- a) critical care;
- b) surgical suite (for frozen sections);
- c) emergency care;
- d) specimen evaluation room (in medical imaging for pathologists and cytologists);
- e) morgue/autopsy;
- f) materials management (loading dock);
- g) histology/cytology to flammable stores; and
- h) special chemistry, microbiology (e.g., gas tanks).

### **9.12.3.7 Internal organization**

The internal organization of the laboratory shall be as follows:

- a) The receiving/processing area shall be adjacent to the outside entrance.
- b) The blood product receiving area shall be adjacent to outside entrance.
- c) There shall be a direct link between receiving areas and send-out to specimen collection areas.
- d) The core lab shall be adjacent to central processing/referral and receiving and shared services.
- e) The coagulation zone in the core lab shall be adjacent to the haematology zone.
- f) The transfusion medicine section shall be adjacent to central processing/referral and receiving, shared services, and the core lab.
- g) There shall be a dedicated convenient entrance to transfusion medicine for HCF personnel and courier staff.
- h) The microbiology section may be open-plan and adjacent to the core lab, unless prohibited by applicable requirements.

**Note:** *Applicable requirements can include provincial/territorial and local regulations for biosafety.*

- i) The histology/cytology area should be located to provide easy access by pathologists. This area should be integrated into the main laboratory.
- j) The tissue processing area shall be located to support both histology and cytology.
- k) The quick section room shall remain in the lab.
- l) The administrative offices shall be located outside of the secure laboratory area.
- m) Technical specialists' offices shall be located within the specific diagnostic area.
- n) Pathologists' working space and offices shall be within or adjacent to their specific diagnostic area.

- o) The morgue/autopsy suite shall be accessible for internal transfer of bodies within the HCF through non-public corridors.
- p) Central shared services area may be provided.
- q) Access to staff facilities shall be provided, conveniently located for staff use.
- r) Provision for the holding of clean and working lab coats at or near the laboratory entrance shall be made.
- s) The autopsy room shall have direct access to the body storage area of the morgue.
- t) There shall be provision for escorted public access to the morgue viewing area, pathologists, and administration area.
- u) The morgue/autopsy suite shall be designed to accommodate a bariatric person.

### **9.12.3.8 Adaptability and flexibility**

The following standards apply to all laboratory departments and shall be addressed in the planning and design:

- a) In order to promote adaptability and flexibility, locating the laboratory adjacent to another soft area should be considered, allowing for its use if expansion of the lab is contemplated in the future.
- b) Laboratory areas/work zones should have similar layouts, configurations, equipment/casework, and services to allow for maximum flexibility now and in the future.
- c) Laboratory areas should be organized in pods/zones/areas, which can be modified depending on future needs.
- d) Fixed workstations should be minimized and service utilities should be designed for accessibility, with emphasis upon emergency generator and UPS power (many laboratory equipment items require non-standard voltages).

### **9.12.3.9 Lighting**

Lighting for laboratory spaces shall be designed to facilitate the accurate reading of test results (especially when they involve colour changes), and to promote staff comfort and safety. The following design points shall be considered in the planning:

- a) Natural spectrum lighting should be provided for accurate colour rendition of clinical samples, as well as to promote staff safety and reduce fatigue.
- b) Controlled natural light should be provided to provide a pleasant working environment for the staff; however, direct sunlight onto benches and equipment should be avoided not only to minimize glare to staff but also because some chemicals can become unstable or their properties altered if exposed for extended periods. Some equipment can also be unstable or intolerant to direct sunlight.
- c) Provision shall be made for dark rooms where they are needed for tests. There should be a means to override emergency power and lighting if they would defeat the purpose of the dark room.
- d) A darkroom shall be provided if photographic printing will be done.

### **9.12.3.10 Acoustics**

Laboratories shall be designed to minimize unnecessary noise. Design provisions for acoustics shall include the following:

- a) Means should be used to reduce loud and sudden noise.
- b) Where possible, areas with bench-mounted equipment that emits noise or vibrations should have sound proof acoustical material around the work area and benches should be engineered to reduce the transfer of vibration to other bench areas.

- c) Sound-dampening devices should be considered. Refer to applicable requirements.  
**Note:** Provincial/territorial health and safety regulations can apply.
- d) Provision shall be made for vibration-free benches or equipment mounts if this is needed for specific equipment (e.g., microscopy).  
**Note:** Bench-mounted equipment is generally heavier than the standard countertop loading allowance and frequently a source of vibration and acoustic interference. This can interfere with microscopy, microtomy, auto-analyzers, and the ability of staff to focus upon detailed or repetitive work.
- e) Because of infection-control issues, acoustic materials, such as sound-absorbing ceiling tiles, should be replaced, rather than cleaned, when soiled.

#### **9.12.3.11 Special considerations**

Laboratory design shall take into account the following special considerations:

- a) The HCF shall consult applicable requirements and standards for safety. A risk analysis should be performed to determine which activities or materials could present a hazard.  
**Note:** Many operations in the laboratory are inherently hazardous, necessitating use-specific dedicated ventilation and temperature control, physical separations, or safety devices such as emergency deluge shower and eyewash.
- b) If a deluge shower is provided, there shall be means to contain the water (e.g., using a sloped floor). Where automated equipment is equipped with drains, systems should be designed so that drains can be maintained (i.e., able to be flushed, and configured so they don't dry out).  
**Note:** Provincial/territorial occupational health and safety regulations can apply.
- c) Hazard warning identification symbols shall be posted at lab entry points and at workstations.
- d) Planning for point-of-care testing shall utilize design input from laboratory staff, who will be responsible for quality assurance of remote equipment and confirmation of processes conducted there.
- e) There shall be space and appropriate hookups for point-of-care devices that are brought to the lab.  
**Note:** These devices can need equipment and connections to permit data download, maintenance, replacement of consumables, etc.
- f) Local and remote alarms for power failure or equipment failure should be provided for sensitive equipment used for diagnostic processes (e.g., incubators and centrifuges) and for refrigerators or freezers used for storage of samples, reagents, blood, and blood products. In a transfusion service, alarms shall be provided in accordance with CAN/CSA-Z902.
- g) Uninterrupted power supply connections should be used for testing and analysis equipment for which electrical interruption would be detrimental to test results.
- h) Sensitive or critical equipment in stat labs, high volume core labs, and transfusion services shall be connected to emergency power or an uninterruptable power supply.
- i) Monitors should be suspended to preserve bench space.
- j) Work surfaces shall be self-coved, chemical and impact resistant, and washable.
- k) There should be a means for securing large equipment and instruments against shifting, especially in earthquake zones.
- l) Process sinks shall be provided.
- m) Purified water shall be available in the laboratory. Water systems may be centrally located in the HCF, or local to the laboratory. The systems for providing purified water (e.g., distilled, deionized, reverse osmosis) shall comply with applicable standards. See AAMM TIR 34.

### 9.12.3.12 Infection prevention and control

Infection prevention and control provisions in laboratories shall take into account the following requirements and recommendations:

- a) Appropriate provisions should be made for infection prevention/contamination control, including anterooms and vestibules for sensitive work areas.
  - b) Laboratory spaces shall comply with CAN/CSA-Z317.2, and space planning should be supported by directional airflow patterns from clean to less clean operations.
- Note:** Environmental quality is fundamental to infection prevention and control, credible diagnostic analysis, and human comfort, necessitating closely monitored and controlled air change rates, temperature and relative humidity ranges, relative "pressure" differentials between uses, and dedicated versus recirculation ventilation systems determining ambient air quality.
- c) Provision shall be made for clothing change and hand sanitization at the exit from the laboratory.
  - d) Internal traffic routes should be generous and well defined.
  - e) The design should minimize the need for internal traffic by non-lab personnel. Administrative areas, supply, and waste removal activities should be located at the lab perimeter.
  - f) Exposed surfaces should be impact-resistant in accordance with function, chemical resistant, and self-coved, minimizing unhygienic crevices and concealed spaces.
  - g) There shall be access to in-house or referral disposal of biological waste.
  - h) Biosafety cabinets for specimens in central receiving shall be provided.
  - i) Handling of damaged or unlabelled incoming specimens shall be done in a biosafety cabinet (see NSF/ANSI 49).
  - j) There shall be a clean space with a hand hygiene sink in the phlebotomy area for the preparation of trays and storage of phlebotomy carts.

### 9.12.3.13 Occupational health and safety

Occupational health and safety provisions in laboratories shall include the following:

- a) Functional and storage space shall be provided for
  - i) chemicals used in the unit;
  - ii) sharps disposal containers;
  - iii) spill kits used for the chemicals in the laboratory; and
  - iv) storage and disposal of personal protective equipment (e.g., gloves, safety glasses, dedicated shoes, respirators, and protective garments).
- b) Storage should be between knee and shoulder height.
- c) Space shall be provided for SDS and specific hazards information in accordance with applicable requirements. See ISO 15189 and ISO 15190. Relevant information should be available at key reference points (e.g., lab entrances and at workstations where hazards could occur).

**Notes:**

- 1) Provincial/territorial regulations can apply.
  - 2) Specific hazard warning symbols apply in situations where biohazards and other hazards (e.g., chemical, radiological, fire/flammable) are present.
- d) Functional space and utilities shall be provided for the biosafety cabinet and chemical fume hood based on the activities in the lab.
  - e) Chemical fume hoods shall provide sufficient leg space for seated work if functions will require extended sitting times.
  - f) General and task lighting shall be adequate and provided over the work areas.
  - g) Adjustable ergonomic workstations and chairs should be used. Eyewash facilities shall be positioned for immediate access in case of an incident.

- h) Work benches and surfaces shall have sufficient leg clearance for work from a standing or seated posture on high stools.

**Note:** Some equipment might need to be lowered into work surfaces to produce the appropriate operating height.

- i) Biosafety cabinets and fume hoods shall meet applicable requirements.

**Notes:**

- 1) Regulatory requirements and guidance for biosafety cabinets are maintained by PHAC and the CFIA (i.e., Canadian Biosafety Standard).
- 2) Provincial/territorial regulations can also apply.
- 3) For fume hoods, environmental regulations apply (Environment Canada as well as P/T environmental regulations).
- 4) Applicable standards include ANSI/NSF 49 and ASHRAE 110.

### 9.12.3.14 Technology considerations

Technology considerations in laboratories shall include the following:

- a) The laboratory information system (LIS), if present, shall be integrated with the HCF's information system for requisitioning tests and reporting.
- b) Any chosen LIS system shall also have the capability to interface (integrate) with known lab analyzers, ehealth technologies (e.g., lab repository, image repositories), and other equipment and supporting devices (e.g., scanners, faxes, copiers, printers).
- c) LIS systems should be compatible or connectable to EMR systems.
- d) LIS systems should be compatible across different laboratory information systems, to permit transfer of test results.
- e) Refrigerators and freezers shall be classified as described in Clause 7.3.9.

### 9.12.3.15 Safety and security

#### 9.12.3.15.1

Laboratories generally provide most of their services during the day, with reduced staffing for afternoon and night shifts. Laboratories shall be designed to protect the safety and security of staff, particularly in the afternoon and evening shifts. The laboratory design shall

- a) provide adequate security so that unauthorized visitors (as well as unauthorized staff) are not able to enter the secure area;
- b) protect the records against loss, damage, or use by unauthorized personnel at all times;
- c) provide limited unit entry/exit points keyed or electronic;
- d) provide local and central monitored alarms for unauthorized entry or egress; and
- e) provide clear lines of sight for single entry control and observation of the waiting area(s) staff.

#### 9.12.3.15.2

Reception/registration counters shall present a sufficient barrier to intruders (i.e., resistant to climbing and entry) and shall be able to be secured when the station is not staffed.

### 9.12.4 Space details

#### 9.12.4.1

Laboratories should utilize mobile, modular workstations and limit the use of fixed workstations to support transition to and replacement of automated processors and analyzers. Workstations shall include adaptable, modular storage; provide connectivity to accessories such as keyboard trays and cable management; and provide adjustable height work surfaces.

**9.12.4.2**

A biosafety cabinet shall be provided for the handling of damaged, unlabelled, unpackaged, or improperly packaged incoming specimens.

**9.12.4.3**

Space design shall take into account biological safety cabinets and fume hoods, including air circulation considerations. See CSA Z316.5.

**9.12.4.4**

Local exhaust should be used for equipment that produces high humidity (autoclave), odours, and high heat load.

**9.12.4.5**

Table 9.11 presents the standard requirements for key spaces in the clinical laboratory area. Common areas are detailed in Clause 11.

**Table 9.11**  
**Key space requirements and recommendations — Clinical laboratory**  
(See Clause 9.12.4.5.)

Item no.	Room name	Net area, m <sup>2</sup>	Requirements and recommendations
1	Histology/ cytology pathology consultation	Varies, some models might require space for occupant and consultant	<b>Mandatory:</b> a) The lab shall be in close proximity to histology clinics. b) Adequate space shall be provided around microscopy equipment for consultations between staff.
2	Central processing/ referral and receiving, general zone	Project-specific; not less than 22.5	<b>Mandatory:</b> a) The area shall provide accommodations capable of 24 h/day operation in conjunction with transfusion medicine and core lab services. b) Access to in-house or referral disposal of biological waste shall be provided. c) Space shall be provided for PPE and areas shall be designed to permit compliance with applicable requirements for biosafety and the storage and transfer of dangerous goods. <b>Note: Federal regulations apply.</b> d) Dedicated hand hygiene sinks shall be provided at all exits from the laboratory. e) Eyewash fixtures and deluge showers that meet applicable requirements shall be provided. <b>Note: Refer to provincial/territorial regulations for occupational health and safety.</b> f) Minimum equipment shall include biosafety and fume cabinets, centrifuges, 4 °C and -20 °C storage, an incubator, and ventilated fluid storage. Electrical equipment shall have access to emergency power and to UPS, as required.

(Continued)

**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p>g) Ambient and task lighting shall stress high-quality colour rendition.</p> <p>h) Critical dimensions, clearances, and tolerances shall be dictated by equipment and safe traffic flow of staff and materials.</p> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Incoming materials can include biohazardous specimens, flammable and toxic chemicals, and radio-active substances.</li> <li>b) Wireless communications networking should be considered, if information security can be achieved.</li> <li>c) Desk height should conform to accessibility requirements.</li> <li>d) The minimum depth of the counter should be 800 mm.</li> </ul>
3	Specimen collection		<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Space shall include a hand hygiene sink (if multiple stations, not less than one sink for every two places).</li> <li>b) A separate clinical technique sink shall be provided.</li> <li>c) Space shall be provided for storage of phlebotomy supply carts and for preparation of biopsy procedure trays.</li> <li>d) Patient reception and procurement areas shall accommodate wheel chair or bed access in accordance with the functional program.</li> <li>e) At least one bed shall be available in the service.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) The room may be configured to accommodate multiple patients, provided appropriate privacy is provided.</li> <li>b) In central or regional hospitals, space may be provided to accommodate wheelchair or bed access for bedridden patients who are transferred from long-term care facilities/nursing homes.</li> <li>c) Design should consider a pass-through facility (e.g., a cupboard) for collections washrooms.</li> </ul>
4	Central processing/referral and receiving, receiving and send-out	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A fume cabinet and ventilated storage cabinets shall be used for management of volatiles and acid.</li> <li>b) Adequate storage for shipping containers and documentation shall be provided.</li> </ul> <p><b>Advisory:</b></p> <p>A pneumatic tube station at this location should be provided.</p>
5	Central processing/referral and receiving	Project-specific	<p><b>Mandatory:</b></p> <p>Hand hygiene facilities for both patients and staff shall be provided.</p>
6	Central processing/referral and receiving, processing	Project-specific	<p><b>Mandatory:</b></p> <p>Space and equipment shall be accessible from receiving and send-out and from the general lab zone; minimum equipment shall include a LIS/LAN workstation, fume cabinet, biosafety cabinet, centrifuge, label printer, and distribution bench.</p>

*(Continued)*

**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) This area is a sub-set of the receiving and send-out function, where preparation of samples is done prior to referral to a specific lab specialty.</li> <li>b) Refrigerators or freezers should be provided for pre- and post-specimen storage.</li> </ul>
7	Central processing/referral and receiving, specimen holding	Project-specific	<p><b>Mandatory:</b></p> <p>Space and equipment for overnight holding of inbound specimens shall be provided; minimum equipment shall include +4 °C refrigeration and incubator.</p> <p><b>Advisory:</b></p> <p>A -20 °C freezer should be provided.</p>
8	Central processing/referral and receiving, specimen storage	Project-specific	<p><b>Mandatory:</b></p> <p>Space and equipment for post-processing/pre-pick-up of specimens shall be provided; minimum equipment shall include +4 °C refrigeration and -20 °C freezer.</p> <p><b>Advisory:</b></p> <p>An ultra-low temperature freezer (-80 °C) should be provided for large facilities and specialty labs.</p>
9	Core lab, general zone	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Easily accessible eyewash stations and an emergency deluge shower shall be provided.</li> <li>b) UPS and non-standard voltage shall be provided.</li> <li>c) Power shall be provided by the essential electrical system.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Oversized doors at building circulation corridors for change-out and movement of floor-mounted equipment should be provided.</li> <li>b) Overhead services on both normal and essential electrical power sources should be provided.</li> </ul>
10	Core lab, chemistry, primary, stat, and back-up	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Ready access to reagent storage shall be provided.</li> <li>b) A LIS/LAN workstation, +4 °C refrigeration, and -20 °C freezers shall be provided.</li> </ul>
11	Core lab, urinalysis	Project-specific	<p><b>Mandatory:</b></p> <p>High level of exhaust ventilation shall be provided to compensate for specimen odour.</p> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) The process sink should have backdraft ventilation.</li> <li>b) A biosafety cabinet for opening of capped specimen containers should be provided.</li> </ul>
13	Core lab, haematology, primary and back-up	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The lab shall be situated near central processing/referral and receiving.</li> </ul>

*(Continued)*

**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<ul style="list-style-type: none"> <li>b) Substantial bench space for fully automated analyzers (which can include adjacent countertop modules) shall be provided.</li> <li>c) Microscopy shall have a vibration-damping work surface.</li> <li>d) A stainer shall be provided for microscopy and storage for slides.</li> <li>e) Ventilated storage shall be provided for the methanol used by stainers. The area shall have self-coved impact and chemical resistant bench tops.</li> <li>f) Access to +4 °C refrigeration shall be provided.</li> <li>g) There shall be daily access to the front, back, and side of fully automated analyzers .</li> <li>h) Emergency power shall be available for sensitive and critical equipment.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) LIS connection should be considered.</li> <li>b) Special drains (e.g., self-flushing floor drains for automated analyzers, should be considered).</li> </ul>
12	Core lab, coagulation	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) This lab zone shall be adjacent to haematology and be open to the remainder of the lab; it is similar in fit-out to haematology and chemistry, and shall be equipped with stable work surfaces for heavy and vibration-generating equipment.</li> <li>b) The area shall have self-coved, impact- and chemical-resistant bench tops.</li> <li>c) The area shall have a land line telephone or reliable communication device for power failures/disasters.</li> <li>d) Analyzers shall be connected to emergency power or an uninterruptable power supply.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) The area should have a -20 °C freezer.</li> <li>b) Typical equipment includes +4 °C refrigerators, centrifuges, and analyzers requiring reagents.</li> </ul>
13	Core lab, special biochemistry/immunology	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Emergency power and UPS shall be used.</li> <li>b) A LIS/LAN workstation shall be provided.</li> <li>c) The area shall have a land line telephone or reliable communication device for power failures/disasters.</li> </ul> <p><b>Note:</b> In this type of laboratory, prepared samples are automatically processed and results recorded on a small benchtop or large floor-mounted equipment to identify chemical compounds in body fluids. In addition to immunoassay analyzers, the laboratory could include equipment for immunofluorescence microscopy. Electrophoresis and high-pressure liquid chromatography (HPLC) could be taken at higher level labs.</p>

(Continued)

**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
14	Core lab, chemistry, manual	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Small benchtop analyzers, a LIS/LAN workstation, and access to +4 °C refrigeration shall be provided.</li> <li>b) The area shall have a land line telephone or reliable communication device for power failures/disasters.</li> </ul> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p>
15	Core lab, blood gases	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The lab shall be located near central processing/referral and receiving.</li> <li>b) Automated countertop analyzer(s) stations and a LIS/LAN workstation shall be provided.</li> <li>c) The area shall have a land line telephone or reliable communication device for power failures/disasters.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>This activity is sometimes performed by other health care professionals at point-of-care, such as emergency care and ICU. The process and equipment remains under control of the laboratory.</i></li> </ol>
16	Core lab, immunoassay, and rapid microbiology	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A primary and back-up benchtop analyzer, a microscope, and a LIS/LAN workstation shall be provided.</li> <li>b) The area shall have a land line telephone or reliable communication device for power failures/disasters.</li> </ul> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p>
17	Core lab, manual fluids/ differentials (haematology)	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A LIS/LAN workstation, microscope, bio-safety cabinet, cell counter, and process sink shall be provided.</li> <li>b) The area shall have a land line telephone or reliable communication device for power failures/disasters.</li> </ul> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p> <p><b>Advisory:</b> Provision should be made for a slide scanning device, for facilities that do not have staff skills available to perform morphology, to link the site to a reference referral laboratory.</p>
18	Core lab, fluorescent microscopy	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Space which can be darkened shall be provided.</li> <li>b) A LIS/LAN workstation and a specialized microscope shall be provided.</li> </ul>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p>c) The area shall have a land line telephone or reliable communication device for power failures/disasters.</p> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p> <p><b>Advisory:</b> De-ionized water tap should be provided.</p>
19	Core lab, point-of-care	Project-specific	<p><b>Mandatory:</b> The area shall have a land line telephone or reliable communication device for power failures/disasters.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>This activity involves the management of instrumentation used outside of the laboratory zone proper, to calibrate equipment, provide documentation, and review reports for quality control. The process and equipment remains under control of the laboratory.</i></li> </ol>
20	Core lab, documentation station	Project-specific	<p><b>Mandatory:</b></p> <ol style="list-style-type: none"> <li>a) A segregated off-bench LIS/LAN workstation for core lab quality assurance shall be provided.</li> <li>b) The area shall have a land line telephone or reliable communication device for power failures/disasters.</li> </ol> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p>
21	Core lab, storage, general	Project-specific	<p><b>Mandatory:</b> Room temperature storage capacity for pre-service and disposable material utilizing adjustable shelving and appropriate containers shall be provided.</p> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p>
22	Core lab, validation, training and evaluation centre	Project-specific	<p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1) <i>The need for a training and evaluation centre will depend on the laboratory size, its role in the community, and the availability of other training centres, as outlined in the project-specific functional program. This facility is not necessarily needed in all labs.</i></li> <li>2) <i>This area provides space for trialing of new or replacement equipment and acts as a staff training centre before equipment is put into service in the laboratory.</i></li> </ol>
23	Transfusion medicine, general zone	Project-specific	<p><b>Mandatory:</b></p> <ol style="list-style-type: none"> <li>a) Transfusion medicine shall be an enclosed space designed to provide a dispensing service available on a 24 h basis, provided through a dedicated entrance/egress point, for convenient access for HCF personnel and courier service. It</li> </ol>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p>shall be adjacent to central processing/referral and receiving and core lab.</p> <p>b) Wall, floor, and ceiling surfaces, as well as fitments, shall be chemical-resistant and self-coved, minimizing crevices and concealed spaces; work surfaces shall be light-coloured and without patterns, which could obscure observation of spills.</p> <p><b>Note:</b> <i>By its nature, transfusion medicine is a bio-hazardous area necessitating easily decontaminated surfaces, bio-disposal services, special spill kits and PPE.</i></p> <p>c) Process sinks and dedicated hand hygiene sinks, as well as eyewash appliances, shall be provided. Lighting shall reinforce colour rendition.</p> <p>d) Typical equipment shall include biosafety cabinets, blood refrigerators, -20 °C and ultralow freezers, centrifuges, platelet storage shakers, and dry ice makers. Biosafety and fume cabinets, transfusion analyzers, and shakers shall use UPS power. Reagent and specimen refrigerators shall have emergency power. Refrigerators and freezers shall be alarmed and monitored by a central station on a 24/7 basis.</p> <p>e) Operational considerations shall include ensuring identification and separate refrigerated storage for blood products, reagents, and specimens.</p> <p>f) Inbound and outbound product streams shall be segregated.</p> <p>g) Supplies are delivered in large bins; space for storage of empty storage bins prior to pick-up shall be provided.</p>
24	Transfusion medicine, receiving	Project-specific	<p><b>Mandatory:</b></p> <p>a) Vestibule entrance shall be secure, permitting supplies to be deposited without entry to the receiving area proper. This offers transfusion medicine staff greater control over segregation of blood and blood product materials, which are stored and handled along separate paths.</p> <p>b) A LIS/LAN workstation shall be provided at the entrance area, where receiving, break-out, recording, and transfer to processing and storage takes place.</p> <p><b>Advisory:</b> Extra-wide doors to facilitate movement of supply carts and other large equipment should be provided.</p>
25	Transfusion medicine, dispensing	Project-specific	<p><b>Mandatory:</b></p> <p>a) The dispensing activity shall be designed to operate on a 24 h basis.</p> <p>b) +4 °C refrigerators with individual temperature recording devices shall be provided.</p> <p>c) A LIS/LAN workstation for recording transfer operations shall be provided.</p> <p><b>Advisory:</b> Although the dispensing function may take place in the same physical space as receiving, each process should have its own +4 °C refrigerators with individual temperature recording devices.</p>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
26	Transfusion medicine, storage, specimens and reagents	Project-specific	<p><b>Mandatory:</b> +4 °C refrigeration and –20 °C or ultra-low freezers shall be provided.</p>
27	Transfusion medicine, storage, blood components	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) +4 °C refrigeration and –20 °C or ultra-low freezers shall be provided.</li> <li>b) Refrigerators and freezers shall comply with the requirements of CAN/CSA-Z902.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) A walk-in refrigerator with a glycerol temperature monitor and an alarm for storage of blood components should be provided in larger sites.</li> <li>b) An intercom system should be provided that connects to the ORs, emergency, and critical care areas.</li> </ul>
28	Transfusion medicine, specimen testing station, manual	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) An area to type and cross-match blood shall be provided.</li> <li>b) Space for a cell washer or centrifuge shall be provided.</li> <li>c) Task lighting at the inverted microscope, an open bench space for handling of materials, a LIS/LAN workstation, and a land line telephone shall be provided.</li> </ul> <p><b>Note:</b> This is a specialized service that could be a requirement of the project-specific functional program.</p>
29	Transfusion medicine, specimen testing station, automated	Project-specific	<p><b>Mandatory:</b> This space shall include a LIS/LAN workstation plus clear bench space to process specimens in support of the automated analyser.</p> <p><b>Note:</b> This is a specialized service that could be a requirement of the project-specific functional program.</p>
30	Transfusion medicine, blood component preparation, clean	Project-specific	<p><b>Mandatory:</b> Bench space for a plasma thawing device, agitator, water bath, and bio-safety cabinet shall be provided.</p> <p><b>Note:</b> This is a specialized service that could be a requirement of the project-specific functional program.</p>
31	Microbiology, general zone	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) This area contains biological hazards and flammable chemicals; therefore, the workplace shall be easily sanitized and supported by bio-disposal services and spill kits, and appropriate PPE shall be worn. Surfaces shall be chemical resistant and self-coved for cleaning, minimizing crevices and concealed spaces.</li> <li>b) Hand hygiene facilities shall be provided at the entrances and exits and within short distances within the lab.</li> <li>c) Eyewash and deluge showers shall be within a short travel distance from workstations, in accordance with applicable requirements.</li> </ul> <p><b>Note:</b> Provincial/territorial regulations apply.</p>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p>d) Process sinks with treated water and special drains on an activity-specific basis shall be provided.</p> <p>e) Emergency power throughout microbiology, and UPS to equipment with computer processors and recorders, shall be provided.</p> <p>f) Typical equipment shall include biosafety cabinets, incubators, manual and autostainers requiring equipment-specific exhaust ventilation, microscopy with provision for vibration minimization, centrifuges, solvent and flammable storage cabinets, +4 °C refrigeration, and –20 °C and ultra-low freezers.</p> <p><b>Advisory:</b></p> <p>a) Microbiology has frequently been separated from the remainder of the lab; however, except for a few specific cases (clean rooms, virology-, mycobacteriology- and/or mycology-testing), it may remain open internally for safety oversight. Enclosure of the services, and its parts, is to be dealt with on a project-specific basis.</p> <p>b) Specialty gas, piped from a central location, is rarely required; however, manifolded cylinders of inert gases, such as CO<sub>2</sub>, could be required for some equipment, such as incubators.</p>
32	Microbiology, set-up bench	Project-specific	<p><b>Mandatory:</b></p> <p>A LIS/LAN workstation with barcode printer, biosafety cabinet, cytofuge; microscope with vibration damping table, staining sink, and +4 °C refrigeration shall be provided.</p> <p><b>Advisory:</b></p> <p>Automated specimen inoculators might require bench space.</p>
33	Microbiology, incubation	Project-specific	<p><b>Mandatory:</b></p> <p>a) Monitored, automated blood culture incubators or a walk-in controlled environment chamber shall be provided.</p> <p>b) Compressed gas cylinders shall be provided for incubators.</p>
34	Microbiology, staining	Project-specific	<p><b>Mandatory:</b></p> <p>A LIS/LAN workstation, stainers, microscope, process sink, and +4 °C refrigeration shall be provided.</p> <p><b>Advisory:</b></p> <p>Stainers use volatile organic compounds, so should be enclosed and ventilated.</p>
35	Microbiology, routine work-up	Project-specific	<p><b>Mandatory:</b></p> <p>A LIS/LAN workstation with a cleanable keyboard, bench space with biological waste disposal container, microscope, and high-intensity task lighting shall be provided.</p> <p><b>Advisory:</b></p> <p>The workstation CPU and monitors should be off-bench to maximize workspace. Suspended monitors should be provided.</p>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
36	Microbiology, blood cultures	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Direct line of vision to the auto-analyser to alert the user of a positive result shall be provided.</li> <li>b) A centrifuge, biosafety cabinet, and blood culture auto-analyser shall be provided.</li> </ul> <p><b>Note:</b> This area produces a large amount of glass bottle waste.</p>
37	Microbiology, susceptibility/ ID	Project-specific	<p><b>Mandatory:</b></p> <p>A LIS/LAN workstation, automated susceptibility analysers, loaded with inoculated media, dedicated +4 °C refrigeration, reagent storage, and clear bench space shall be provided.</p> <p><b>Advisory:</b></p> <p>This area design should allow for the management and disposal of large quantities of biological waste.</p>
38	Microbiology, documentation station	Project-specific	<p><b>Mandatory:</b></p> <p>A segregated off-bench LIS/LAN workstation for microbiology lab quality assurance shall be provided.</p>
39	Microbiology, storage, general	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Walk-in or +4 °C refrigerators to maintain a minimum of four days media supply (over a long weekend), as well as refrigerated specimens, a -20 °C freezer, an ultralow temperature freezer, and adjustable shelving shall be provided.</li> <li>b) Work area for processing of media for quality control shall be provided.</li> </ul>
40	Microbiology, media receiving and quality control	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A recording LIS/LAN workstation for logging-in shall be provided.</li> <li>b) The storage area shall include separate accommodation for pre- and post-quality control media.</li> <li>c) Media is temperature-sensitive; therefore, accommodation for in-process storage shall be provided.</li> <li>d) If reusable medical devices are used, reprocessing shall be done in accordance with CAN/CSA-Z314 and the appropriate sterilization standards, preferably in the MDRD.</li> </ul> <p><b>Advisory:</b></p> <p>A media preparation area should be provided.</p> <p><b>Note:</b> Media can be delivered in "pallet quantities" and require a table for sorting. Space is also required for the supply drop, break-out, and sorting, and for empty containers prior to disposal. Up to 30 types of media arrive in a shipment, to be broken out from containers, sorted, sampled, and logged. Disposal of cardboard cartons is an issue.</p>
41	Microbiology, storage, room temperature	Project-specific	<p><b>Mandatory:</b></p> <p>Adjustable shelving shall be provided.</p>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
42	Microbiology, virology, general	Project-specific	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>Activities include PCR and microscopy of inoculated tissue cultures requiring dimming of lights.</i></li> <li>3) <i>Virology is generally carried on in a segregated space (for set-up of DNA amplification) or in a biological safety cabinet to minimize contamination from adjacent microbiological work.</i></li> </ul>
43	Microbiology, control infection control office	Project-specific	<p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p>
44	Microbiology, molecular diagnostics	Project-specific	<p><b>Mandatory:</b> A separate, positive pressure, clean space for PCR sample preparation shall be provided.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>The real time polymerase chain reaction thermocycler (RT/PCR) can be located in the open lab; the high air quality of the separate space, required to minimize contamination of the sample by viruses or bacteria, can be provided in a biosafety cabinet.</i></li> </ul>
45	Microbiology, immunofluorescence	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A space that can be darkened shall be provided.</li> <li>b) A LIS/LAN workstation and a specialized microscope shall be provided.</li> <li>c) Consideration should be given to evolving technology (e.g., digital cameras and scanners and associated software for integration with laboratory information system)</li> </ul> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p>
46	Histology/ cytology, general	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Surfaces shall be washable (or disposable).</li> <li>b) Space shall be provided for PPE (including chemical respirators) and special spill kits.</li> <li>c) Provision shall be made for access by bio-disposal services.</li> <li>d) Ceilings shall be accessible for cleaning if necessary.</li> <li>e) Hand hygiene sinks and process sinks, as well as deluge shower and eyewash stations, shall be provided.</li> <li>f) Lighting shall be selected to facilitate accurate colour rendition.</li> <li>g) Essential equipment (e.g., ventilated cabinets) shall be connected to emergency power or uninterruptible power supply as appropriate to its function and the level of risk.</li> <li>h) Ventilated reagent storage cabinets shall be provided.</li> </ul>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
<b>Advisory:</b>			
47	Histology/ cytology, histology	Project-specific	<p>a) Proximity to the surgical suite is preferred.</p> <p>b) Typical equipment should include fume and biosafety cabinets, backdraft or downdraft ventilated benches and grossing stations, solvent recyclers for ethanol and formaldehyde, ventilated tissue storage cabinets, cytofuge, centrifuge, and secure storage.</p> <p>c) Typical hazards include biohazards, flammables, toxic chemicals, and could include radioactivity.</p> <p>d) Space requirements for the following laboratory-related areas or activities depend on workflow and program requirements:</p> <ul style="list-style-type: none"> <li>i) pathology consultation;</li> <li>ii) specimen evaluation in diagnostic imaging; and</li> <li>iii) specimen evaluation in surgical services.</li> </ul> <p>e) A separate room for the segregation of tissue processors should be provided.</p> <p>f) An ergonomic workstation design should be provided. This area is subject to air quality issues, equipment heat dissipation, and specialized equipment direct venting.</p> <p>g) This area should have access to water, water baths, and autostainers.</p>
48	Histology/ cytology, solution preparation	Project-specific	<p><b>Mandatory:</b></p> <p>a) A minimum of 2 m wide workspace for sorting shall be provided.</p> <p>b) Easy access for pathologists shall be provided.</p> <p>c) A centralized bio-waste room and refrigerated storage to serve both histology and cytology shall be provided.</p> <p><b>Note: Workflow at histology begins with direct delivery to accessioning, followed by grossing, embedding, microtomy, staining, coverslapping, and delivery to the pathologists.</b></p>
49	Histology/ cytology, interoperative consultation (quick section)	Project-specific	<p><b>Mandatory:</b></p> <p>a) A facility for preparation of working strength solutions shall be provided.</p> <p>b) Space for spill kits and safety supplies shall be provided.</p> <p>c) A safety shower shall be provided.</p> <p>d) A fume cabinet, storage for bulk chemicals and acids, distilled water, and a process sink shall be provided.</p>
50	Histology/ cytology, grossing	Project-specific	<p><b>Mandatory:</b></p> <p>a) A backdraft- or downdraft-ventilated grossing bench, ergonomic design, (adjustable height) shall be provided. The</p>

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**Table 9.11 (Concluded)**

Item no.	Room name	Net area, m <sup>2</sup>	Requirements and recommendations
			<p>technologist shall have access to appropriate PPE (storage required).</p> <p><b>Note:</b> <i>The downdraft exhaust is intended to carry aerosols away from the specimen and technologist.</i></p> <ul style="list-style-type: none"> <li>b) Hand hygiene sink and eyewash shall be immediately available, and a deluge shower in close proximity shall be provided.</li> <li>c) Locking storage for knives shall be provided.</li> <li>d) A process sink equipped for biological waste disposal shall be provided.</li> <li>e) A LIS/LAN shall be provided.</li> <li>f) A computer workstation with printer for cassette labelling and a scale shall be provided.</li> <li>g) In addition to the grossing bench, additional bench space shall be provided to lay-out specimens, storage for specimen containers, and formalin dispensing equipment.</li> <li>h) Space for hands-free dictation, which could be part of the grossing station, shall be provided.</li> <li>i) Where flammable solvents are used (e.g., for grossing, tissue processing, and block storage activities), work areas shall have appropriate ventilation to protect worker safety. These shall be adequate storage for flammable materials.</li> </ul> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1) <i>Monitoring and alarm systems for worker safety and fire safety should be considered.</i></li> <li>2) <i>Provincial/territorial and municipal fire safety codes and occupational health and safety regulations can apply.</i></li> </ol> <p><b>Advisory:</b> Consideration should be given to evolving technology (e.g., digital cameras and scanners and associated software for integration with laboratory information system).</p>
51	Histology/ cytology, processing	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Ventilated tissue-processing equipment shall be provided.</li> <li>b) Where flammable solvents are used (e.g., for grossing, tissue processing, and block storage activities), work areas shall have appropriate ventilation to protect worker safety. These shall be adequate storage for flammable materials.</li> </ul> <p><b>Advisory:</b> Tissue processing supports both histology and cytology functions. This might require a fire separation.</p>
52	Histology/ cytology, histology set-up	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A device to melt paraffin, a work surface, and a LIS/LAN workstation shall be provided.</li> <li>b) Automated or semi-automated microtome, a water bath, and a cold plate shall be provided.</li> <li>c) This area, at the microtome, shall be positioned away from traffic and interruption because the work requires concentration and utilizes very sharp knives.</li> </ul>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p>d) The area shall have ergonomically designed workstations and access to a process sink.</p> <p><b>Notes:</b></p> <ol style="list-style-type: none"> <li>1) <i>The set-up area supports two activities: cutting and embedding.</i></li> <li>2) <i>The embedding activities can lead to wax build-up on benches and floors.</i></li> </ol>
53	Histology/ cytology, special staining/ coverslipping, manual	Project-specific	<p><b>Mandatory:</b> A fume hood with a sink and reagent storage shall be provided.</p> <p><b>Advisory:</b> Typical additional equipment includes a</p> <ol style="list-style-type: none"> <li>a) microscope;</li> <li>b) balance scale;</li> <li>c) microwave;</li> <li>d) small +4 °C refrigerator;</li> <li>e) process sink; and</li> <li>f) LIS/LAN workstation.</li> </ol>
54	Histology/ cytology, special staining/ coverslipping, automated	Project-specific	<p><b>Mandatory:</b></p> <ol style="list-style-type: none"> <li>a) Automated staining and cover-slipping equipment utilizes quantities of flammable solvents; appropriate increased exhaust ventilation and appropriate storage for solvents shall be provided.</li> <li>b) Typical additional equipment shall include a microscope and station-by-station solvent stain, +4 °C refrigerator, process sink, and biological waste discard containers.</li> </ol>
55	Histology/ cytology, microscopy	Project-specific	<p><b>Mandatory:</b> Means shall be provided to damp vibration interference at microscope stations. This can be accomplished through anti-vibration construction or by the use of isolation tables.</p>
56	Histology/ cytology, storage, slide, block, and specimen	Project-specific	<p><b>Mandatory:</b> Specialized storage shall be provided.</p> <p><b>Advisory:</b></p> <ol style="list-style-type: none"> <li>a) Slide storage cabinets, vented tissue storage cabinets, and block storage for histology specimens are stored near the lab; long-term storage, such as the environmentally controlled storage for blocks, may be located off-site; long-term tissue storage is not required.</li> <li>b) Slide storage could involve heavy structural elements.</li> </ol>
57	Histology/ cytology, storage, general	Project-specific	<p><b>Mandatory:</b> A secure, room temperature storage space with locked cabinets shall be provided for the storage of ethanol.</p> <p><b>Note:</b> See provincial/territorial building codes and labour regulations.</p>

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**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
58	Histology/ cytology, storage, cold	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Typical equipment shall include +4 °C refrigerator and –20 °C freezers for long-term storage.</li> <li>b) Freezers shall be monitored and alarmed.</li> </ul> <p><b>Advisory:</b> Ultra-low freezers could be required.</p>
59	Histology/ cytology, cytology	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) This area shall be located adjacent to histology.</li> <li>b) Workflow in cytology begins with accessioning and proceeds through slide preparation in biosafety cabinets; staining and cover-slipping utilize highly flammable solvents. Direct venting shall be provided.</li> </ul>
60	Histology/ cytology, cytology set-up	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Equipment-specific exhaust ventilation shall be provided.</li> <li>b) Typical equipment shall include a biosafety cabinet, centrifuge, stainer, fume hood with reagent storage, +4 °C refrigerator, and process sink.</li> </ul>
61	Histology/ cytology, cytology screening	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A quiet, separate room, equipped with ergonomically-designed workstations shall be provided.</li> <li>b) Typical equipment shall include a LIS/LAN workstation, microscope, and adequate horizontal surface for trays of slides, completion of documentation, and review of reference material.</li> </ul>
62	Histology/ cytology, recycling	Project-specific	<p><b>Mandatory:</b> This area shall be in close proximity to histology, cytology, and tissue processing.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>The recycling of histology flammable solvents necessitates increased ventilation, fire suppression, and physical separation to deal with fire and explosion hazards; this filtration or distillation equipment is generally ported for direct connection to dedicated exhaust.</i></li> </ul>
63	Histology/ cytology, immunohisto- chemistry	Project-specific	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>This process involves manual or automated analysis, utilizing a LIS/LAN workstation, process sink with de-ionized water, and +4 °C refrigerator.</i></li> </ul>
64	Histology/ cytology, cytogenetics	Project-specific	<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>The process uses highly specialized equipment.</i></li> </ul>

*(Continued)*

**Table 9.11 (Continued)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
65	Histology/cytology, flow cytometry	Project-specific	<p><b>Mandatory:</b> Typical equipment shall include a flow cytometer, a biosafety cabinet, a preparation bench, and a LIS/LAN workstation.</p> <p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>1) <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></li> <li>2) <i>The instrument utilizes lasers and fluorescence detectors to analyse physical and chemical characteristics of a cell throughput stream. An equipment-specific, controlled environment should be provided for haematology and immunology analyses regarding transplantation, genetics, or tumour studies.</i></li> </ul>
66	Histology/cytology, lab consultation/training	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A room for intra-services consultation and training shall be provided.</li> <li>b) A LIS/LAN workstation and a central, table-mounted multi-headed (5) microscope capable of digital projection shall be provided.</li> </ul> <p><b>Note:</b> <i>This is a specialized service that could be a requirement of the project-specific functional program.</i></p>
67	Morgue and autopsy, general zone	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Dedicated cleaning supplies and drains shall be provided.</li> <li>b) To protect privacy, the areas shall have convenient access to HCF corridors and to a non-public exterior vehicular entrance for the discreet transfer of bodies.</li> <li>c) All areas of the morgue shall be accessible without having to travel through the autopsy room.</li> </ul>
68	Morgue and autopsy, whole body storage	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) An access-controlled, outer zone with a LIS/LAN recording workstation shall be provided; this receiving/dispatch area shall have direct, secure access to a transfer vehicle garage.</li> <li>b) A (bariatric-capable) multi-compartment cooler or cool room separating the receiving/dispatch area from the autopsy room shall be provided.</li> <li>c) A separate containment for foetus and body part storage shall be provided.</li> <li>d) A lifting device for bodies shall be provided.</li> </ul> <p><b>Advisory:</b> Video monitoring for security should be considered.</p>
69	Morgue and autopsy, autopsy room	Project-specific	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Systems and equipment for moving bodies shall be designed for ergonomic safety.</li> <li>b) Means shall be provided for the safe handling of infectious materials and to prevent the transmission of infection from bodies to workers and the public.</li> </ul> <p><b>Note:</b> <i>See Public Health Agency of Canada (2004).</i></p>

*(Continued)*

**Table 9.11 (Concluded)**

<b>Item no.</b>	<b>Room name</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<ul style="list-style-type: none"> <li>c) There shall be additional security provisions appropriate to the space and activities.</li> <li>d) Lighting shall be designed for clear viewing of autopsy procedures.</li> <li>e) Lockable storage for instruments and potential forensic evidence shall be provided.</li> <li>f) Ventilated storage for tissue shall be provided.</li> <li>g) An adjacent change and PPE storage room with lockers, showers, and washroom shall be provided.</li> <li>h) A downdraft autopsy table and grossing bench, weight scales, lifting device, and access to mobile imaging equipment shall be provided.</li> <li>i) A workstation shall be provided.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) This is a specialized service that could be a requirement of the project-specific functional program.</li> <li>b) Provision should be made for A/V recording equipment.</li> </ul>
70	Morgue and autopsy morgue viewing	Varies	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The lab shall be located adjacent to morgue, whole body storage.</li> <li>b) Entrances shall be set up for escorted entry by HCF staff from an access-controlled and monitored, secure corridor.</li> <li>c) There shall be a secure door and draped acoustic window to stretcher parking.</li> <li>d) The area shall be acoustically-separate, with a ventilation system independent of surrounding areas. See CAN/CSA-Z317.2.</li> <li>e) A family viewing area shall be provided adjacent to the morgue (minimum 10.0 m<sup>2</sup>).</li> </ul> <p><b>Advisory:</b> The area should have cool temperature and low lighting levels.</p>

## 9.13 Pharmacy

### 9.13.1 Description

A pharmacy provides clinical services and medications to patients to a variety of programs in acute, inpatient continuing care or ambulatory settings. Clinical pharmacy services can include direct patient care (e.g., assessment and education).

A pharmacy orders, controls, prepares for dispensing, and dispenses medications for inpatients and emergency patients. It may also provide the same functions for outpatients.

The services provided by pharmacy can include, but are not limited to,

- a) Inpatient and outpatient dispensing;
- b) controlled drug storage and distribution;
- c) drug information;
- d) medication safety;
- e) procurement, inventory control, and secured storage of pharmaceuticals;

- f) administrative and clinical services;
- g) direct patient care activities (e.g., assessment, education);
- h) pre-packaging, compounding, and preparing non-sterile or extemporaneous compounds such as lotions and ointments;
- i) formulary management;
- j) compounding of non-hazardous sterile products including total parenteral nutrition;
 

**Note:** See NAPRA's *Model Standards for Pharmacy Compounding of Non-hazardous Sterile Preparations*.
- k) compounding of hazardous sterile drugs (e.g., chemotherapy), including mixtures;
 

**Note:** See NAPRA's *Model Standards for Pharmacy Compounding of Hazardous Sterile Preparations*.
- l) compounding of non-sterile drugs;
- m) investigational drugs and preparation of drugs for clinical trials;
- n) chemotherapy, including mixtures;
- o) methadone dispensing;
- p) home parenteral therapy service; and
- q) education for patients, their families and caregivers, and staff.

## 9.13.2 Functional requirements

### 9.13.2.1 Patient management

Patient management provisions for pharmacy services shall include the following:

- a) The administration of medications to inpatients shall occur outside the pharmacy.
- b) Patients and families shall not access the secure area of pharmacy.
- c) Accessible areas include reception, waiting and counselling areas for non-pharmacy staff, outpatients, and the public.
- d) Outpatients may collect medications and receive counselling in a secure, dedicated, and confidential (private) area.

### 9.13.2.2 Workflow

Workflow design in pharmacy services shall include the following provisions:

**Note:** Depending on the size of the HCF, satellite pharmacies may be planned for some areas, such as the surgical suite, ICU, mental health, and the chemotherapy area of oncology.

- a) Space provided for preparation of all medications, including IV and cytotoxic drugs, shall be planned in accordance with applicable requirements.
 

**Note:** Requirements for handling and storage of narcotics and controlled substances are addressed in federal regulations, professional standards for pharmacies, and occupational health and safety regulations.
- b) Security measures shall be provided to ensure the security of staff, pharmaceuticals, patients, and patient information.
- c) Provision shall be made for the proper storage, control, and disposal of all pharmaceutical agents, including narcotics and controlled substances, as per applicable laws and guidelines.
- d) Access to convenient staff washrooms shall be provided.
- e) The pharmacy shall have access to a teaching/education/training room, which may be shared with other departments.
- f) The space provided for order entry and distribution of pharmaceuticals shall adhere to all relevant standards, guidelines, and evidence-based practices.

### 9.13.2.3 Support service delivery

The design of support services in pharmacy services shall include the following:

- a) Provision shall be made for the secure handling and delivery of all medications.

- b) Pharmacy shall receive, break out, and store most bulk pharmaceuticals.
- c) Provision shall be made to include pharmacy as part of the IT infrastructure plan. The information technology plan may include interfaces for materials management, accounts payable, and environmental services, which will support the patient care information systems.
- d) Provision shall be made for IT linkages to ensure proper receiving and delivery of pharmaceuticals to the department.
- e) Provision shall be made for environmental services, such as garbage and hazardous waste disposal.
- f) Waste shall be sorted at the point of use by pharmacy and removed from the department by environmental services in accordance with all applicable standards.

### **9.13.3 Technical requirements**

#### **9.13.3.1 General**

These following special considerations are particular to the pharmacy areas and shall be reviewed in the course of design. Responses by individual facilities and programs will vary:

- a) Emergency (protected) power shall be provided as specified in CSA C282 and CSA Z32 for refrigerators, laminar flow hoods, freezers, computers, and consoles.
- b) Laminar flow hoods, computers, and consoles shall be connected to the vital branch of the emergency power system.
- c) Refrigerators and freezers shall be connected to the delayed vital branch of the emergency power system.
- d) Provision shall be made for telephone, fax, and computer cabling (especially if the HCF does not have wireless computer systems).
- e) Drug storage area (stores) should be independently securable.
- f) Drug storage area (stores) shall have provision for safe storage of
  - i) narcotics and controlled substances;
  - ii) quarantined drugs and hazardous drugs; and
  - iii) flammables and combustibles.
- Note:** See *Health Canada requirements and other guidance for the storage of hazardous drugs, narcotics and other controlled substances*.
- g) Refrigerators and freezers shall be classified as described in Clause 7.3.9.
- h) Refrigerators used for the storage of therapeutic products (drugs, medications, etc.) shall be calibrated. Back-up refrigerators should be available in case of overstock or failure.
   
**Note:** *Refrigerators and freezers used in pharmacies can be subject to provincial/territorial regulations or guidelines.*
- i) Refrigerators should be alarmed either independently or centrally monitored as part of the building automation system.
- j) All containment-primary engineering controls (e.g., biological safety cabinets, laminar flow hoods, etc.) shall be vented in accordance with CAN/CSA-Z317.2.
- k) Clean rooms for compounding, when provided, shall comply with the NAPRA standards.
   
**Note:** *Professional requirements by provincial/territorial colleges of pharmacists can apply.*
- l) An area for drug information shall be provided for display and storage of journals, books, and computerized DI access workstations.
- m) Network computer and electrical cabling shall be provided to all rooms, including education/teaching rooms, and allow for expansion of the services.
- n) Provision shall be made for cart or cassette storage in the pharmacy.
- o) An alarm system shall be provided to monitor the pharmacy periphery (doors and windows) and internal secure areas such as the narcotics vault.
- p) A staff emergency assistance alarm system shall be provided.

- q) Counters in preparation areas shall be disinfectant-proof.
- r) The choice of medication delivery systems shall take infection prevention and control practices into account.
- s) Eyewash stations and deluge showers shall be provided in accordance with clean room and occupational health and safety guidelines.

### **9.13.3.2 Acoustics**

Design should consider acoustic privacy at the pharmacy counter and counselling areas.

### **9.13.3.3 Natural light**

Considerations for natural light include the following:

- a) use of natural light should be considered for the benefit of staff;
- b) exterior windows shall not be permitted in sterile compounding rooms;
- c) windows should not be located next to the public area to maintain security and privacy of operations;
- d) some medications are sensitive to natural light. Caution should be taken in locating natural light sources; and
- e) natural light should be controlled in clean room environments.

**Note:** See NAPRA and ISO clean room design requirements.

### **9.13.3.4 Infection prevention and control**

In addition to the general list of infection prevention and control requirements, the following provisions shall be made in this service:

- a) Hand hygiene sinks and/or scrub sinks shall be provided in rooms where open medications are prepared for distribution.
- b) Provision shall be made to protect medications from aerosols or splashing from the hand hygiene sink.
- c) Carts, medication delivery systems, or cassettes selected shall be able to be easily disinfected with disinfectants that are appropriate for use in pharmacies.
- d) Hand hygiene sinks shall not be located in sterile preparation rooms used for compounding of sterile or hazardous drugs.
- e) Air handling systems shall comply with CAN/CSA-Z317.2.

**Note:** For the location of hand hygiene sinks, see NAPRA and ISO clean room standards.

### **9.13.3.5 Materials and finishes**

In addition to the general list of materials and finishes requirements, the following provisions shall be made in this service:

- a) finishes in the sterile preparation buffer area shall promote effective cleaning and disinfection; and
- b) ceiling, walls, floors, fixtures, work surfaces, shelving, counters, and cabinets shall be smooth, impervious, free from cracks and crevices, non-shedding, cleanable, and resistant to disinfectants.

### **9.13.3.6 Technology considerations**

In addition to the general list of technology and communication requirements, the following provisions shall be made in this service:

- a) Communication systems (e.g., phone, data) shall be compatible with existing or planned overall HCF systems, including staff and emergency call systems.
- b) The pharmacy should be included in the IT infrastructure plan regarding the development of automated health records, prescriber order entry systems, clinical decision support systems, etc.

- c) Communications between the main pharmacy, satellite locations, and any pharmacy staff deployed to a clinical area shall be available.
- d) Evaluation of other technologies shall be reviewed. Some equipment may be implemented at the planning stages; but regardless, provisions should be made for adapting space to accommodate the technology in the future.  
*Note: This can require an extensive review of current and emerging technologies and their potential value to the project.*
- e) Planning should consider the following technologies:
  - i) prescriber order entry;
  - ii) automated delivery systems (e.g., conveyor systems, pneumatic tube, etc.);
  - iii) robotics, carousels, and other automated dispensing equipment (e.g., boxpickers, pill packagers, etc.); and
  - iv) IT linkages to ensure proper receiving and delivery of pharmaceuticals to the services.

### **9.13.3.7 Occupational health and safety**

**Note:** The location of eyewash stations and deluge showers might be restricted in clean rooms and compounding areas. Please see NAPRA and ISO design standards.

#### **9.13.3.7.1**

Areas should be designed to

- a) minimize the need for manual lifting and handling of supplies;
- b) provide sufficient storage space in easily reachable locations (e.g., between knee and shoulder height); and
- c) allow staff to work in different positions (e.g., standing, seated in a chair, or seated on a high stool) with sufficient leg clearance under work surfaces and hoods.

#### **9.13.3.7.2**

All containment primary engineering controls (e.g., biological safety cabinets, laminar flow hoods, etc.) and sterile compounding areas shall meet applicable requirements.

**Note:** Federal and provincial/territorial regulations and NAPRA standards and guidelines can apply.

#### **9.13.3.7.3**

Laminar flow hoods shall provide sufficient leg space for seated work.

### **9.13.3.8 Technology considerations**

See Table 9.10 for specific technology considerations for each pharmacy area.

### **9.13.3.9 Safety and security**

#### **9.13.3.9.1**

In addition to the general safety and security requirements, design shall incorporate the following specific features:

- a) minimization of entry and exit points;
- b) maximization of control by the staff through direct observation of all persons entering the area;
- c) access control system;

**Note:** The use of PIN numbers in addition to proximity cards should be considered for access to medications areas.

- d) intruder alarm system to monitor the pharmacy periphery (doors and windows) and internal secure areas, such as the narcotics vault;
- e) staff emergency assistance alarms and security shuttle at the outpatient dispensing counter; and
- f) drug storage room and narcotics vault should not be located on an outside wall.

**Notes:**

- 1) *Pharmacies in HCF deal with a large volume of interactions daily, some involving narcotics and controlled substances. The design should enable staff to manage and, if necessary, limit traffic, especially at dispensing counters for patients, so that proper attention can be given to each person and to each order.*
- 2) *See Health Canada's Directive on Physical Security Requirements for Controlled Substances.*

**9.13.3.9.2**

The pharmacy shall be designed to limit or restrict access by non-pharmacy staff after hours, in accordance with HCF policies.

**9.13.3.9.3**

A lockable pharmacy night cupboard shall be provided for storing medications to meet patient needs when the pharmacy is closed. This cupboard may be a partitioned off section of the pharmacy or a separate dedicated room in a readily accessible location.

**9.13.4 Space details**

Table 9.12 specifies the standard requirements for key spaces in the pharmacy area. Common areas are detailed in Clause 11.

**Table 9.12**  
**Key space requirements and recommendations — Pharmacy**  
 (See Clauses 9.13.3.8 and 9.13.4.)

Item no.	Room names	Net area, m <sup>2</sup>	Requirements and recommendations
1	Outpatient consulting	11.0	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Shelving shall be provided for resource materials.</li> <li>b) Computer and printer access shall be provided.</li> <li>c) Windows from adjacent pharmacy area shall be provided for security.</li> <li>d) A telephone shall be provided.</li> <li>e) The area shall be accessible to patients who use a walker or wheel chair.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) The room should be located adjacent to the public (non-secure) suite entrance.</li> <li>b) For security, there should be separate visitor and staff entrances.</li> </ul>
2	Satellite pharmacy	Varies	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Modular picking station(s) shall be provided.</li> <li>b) Space shall be provided for utility/supply carts.</li> <li>c) A hand hygiene sink and emergency eyewash shall be provided.</li> <li>d) The room shall have positive relative pressurization ventilation.</li> <li>e) Computer workstation(s) shall be provided.</li> <li>f) Alarm monitoring and card control shall be provided.</li> </ul>

*(Continued)*

**Table 9.12 (Continued)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<ul style="list-style-type: none"> <li>g) A refrigerator shall be provided.</li> <li>h) Workspace shall be provided for the pharmacist.</li> <li>i) Additional workspace shall be provided for pharmacy technicians (i.e., for drug distribution activities).</li> </ul>
3	Preparation area	Varies; assume not less than 10.0	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) An order entry workstation with computer, printers, etc., shall be provided.</li> <li>b) The vestibule shall have a hand hygiene sink and emergency eyewash.</li> <li>c) Space shall be provided for storage carts.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) A pass-through refrigerator(s) to the anteroom should be considered.</li> <li>b) For safety, visual monitoring (glazing) from adjacent pharmacy spaces should be considered.</li> <li>c) Coat hooks should be provided.</li> </ul>
4	Sterile compounding anteroom	Varies; assume not less than 10.0	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Space shall be provided for utility/storage carts.</li> <li>b) A scrub sink and emergency eyewash shall be provided.</li> <li>c) Work surfaces and cupboards shall be chemically resistant.</li> <li>d) A refrigerated pass-through to a sterile prep and sterile anteroom shall be provided.</li> <li>e) The ceiling and wall surfaces shall be easily washed and disinfected.</li> <li>f) Storage and hampers shall be provided for linen and gowns.</li> <li>g) There shall be no medication stored in the anteroom.</li> <li>h) Interlocked door operation shall be required.</li> </ul> <p><b>Note:</b> See NAPRA for additional requirements.</p> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Visual monitoring (glazing) from adjacent pharmacy spaces should be considered for safety.</li> <li>b) An automatic door should be considered.</li> <li>c) A freezer should be considered.</li> <li>d) The need for a deluge shower should be evaluated by the HCF.</li> </ul>
5	Sterile compounding area	Varies; assume not less than 30.0	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Laminar flow hood(s) shall be used in this room.</li> <li>b) Space shall be provided for utility/supply carts and other equipment that will be used in the area.</li> <li>c) Visual monitoring (glazing) from adjacent pharmacy spaces shall be provided for safety.</li> <li>d) Positive pressurization shall be maintained to the anteroom.</li> <li>e) An automatic door shall be provided.</li> <li>f) Windows communicating directly with the exterior of the building shall not be permitted.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) A pass-through to the anteroom should be considered.</li> <li>b) Consideration should be given to a door security system.</li> </ul>

*(Continued)*

**Table 9.12 (Continued)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
6	Hazardous drug (chemotherapy compounding anteroom)	10.0	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) If located in a satellite pharmacy, alarm monitoring/card control shall be provided.</li> <li>b) Computer workstations shall be provided.</li> <li>c) There shall be a scrub sink and emergency eyewash.</li> <li>d) Provision shall be made for a supply cart.</li> <li>e) A refrigerator shall be provided.</li> <li>f) Negative pressure shall be maintained to the exterior and positive to the hazardous drug compounding room.</li> <li>g) The anteroom shall be adjacent to a third room such as a vestibule or satellite pharmacy.</li> <li>h) There shall be a pass-through to the chemotherapy prep room.</li> <li>i) Visual monitoring (glazing) from adjacent pharmacy space shall be provided for safety and checking.</li> <li>j) A deluge shower shall be provided.</li> </ul> <p><b>Advisory:</b></p> <p>The following should be considered for inclusion:</p> <ul style="list-style-type: none"> <li>a) pass-through to the exterior;</li> <li>b) automatic door; and</li> <li>c) freezer.</li> </ul>
7	Hazardous drug (chemotherapy compounding room)	Varies; assume not less than 10.0	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Work surfaces and cupboards shall be chemically resistant.</li> <li>b) Visual monitoring (glazing) from adjacent pharmacy space shall be provided for safety and checking.</li> <li>c) An externally vented biosafety cabinet shall be provided.</li> <li>d) Space shall be provided for utility/storage carts.</li> <li>e) Negative pressurization shall be maintained to the anteroom.</li> <li>f) A hazardous waste receptacle shall be provided.</li> <li>g) A refrigerated pass-through to sterile prep and sterile anteroom shall be provided.</li> <li>h) The ceiling and wall surfaces shall be washable and easy to disinfect.</li> <li>i) Storage and hampers shall be provided for linen and gowns.</li> <li>j) Windows communicating directly with the exterior of the building shall not be permitted.</li> </ul>
8	Narcotics vault	Varies, may be a cupboard: not less than 1.5 or secure room not less than 10.0	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Security partitions and a door shall be provided.</li> <li>b) Alarm monitoring and card control shall be provided.</li> <li>c) Shelving shall be provided for drug storage.</li> <li>d) Telephone/intercom system shall be provided.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) A computer workstation should be considered.</li> <li>b) An automatic dispensing unit (ADU) should be considered.</li> <li>c) If a secure room is used, the vault should include a refrigerator.</li> <li>d) The vault should be adjacent to stores, packaging, and dispensing.</li> </ul>
9	Picking station	Varies depending on	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A modular storage/picking component system shall be provided.</li> </ul>

*(Continued)*

**Table 9.12 (Continued)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
		automation, 7.5 for each station if not automated	<p>b) A computer workstation shall be provided. c) A room for medication cart shall be provided.</p> <p><b>Advisory:</b> a) A bar code reader/label system should be considered. b) Access to a telephone should be considered.</p>
10	Order entry	Varies, 4.6 for each workstation and additional circulation space	<p><b>Mandatory:</b> a) A modular multi-user workstation shall be provided. b) A computer and telephone shall be provided. c) Furniture shelving shall be provided. d) Views from the order entry to the entrance shall be provided.</p> <p><b>Advisory:</b> Adjacencies to dispensing, pneumatic tube, and fax should be considered.</p>
11	Packaging area	Varies, may be automated	<p><b>Mandatory:</b> a) Work surfaces/counters shall be provided. b) Multiple electrical receptacles shall be provided.</p> <p><b>Note:</b> Solid and liquid packaging machines will be utilized in this area.</p> <p>c) Adequate storage shall be provided. d) Computers and labelling and bar-coding equipment shall be provided. e) Bulk stores shall be adjacent to the area. f) A hand hygiene sink and emergency eyewash shall be provided.</p> <p><b>Advisory:</b> a) The dispensing area should be nearby. b) The packaging area should be adjacent to bulk stores.</p>
12	Non-sterile compounding area	Varies	<p><b>Mandatory:</b> a) Chemical-resistant work surfaces and counters shall be provided. b) Computer workstations shall be provided. c) A utility sink, with drying area, shall be provided. d) Storage cabinetry shall be provided. e) The area shall have a hand hygiene sink and emergency eyewash. f) Multiple electrical receptacles shall be provided. g) Storage shall be provided for PPE. h) Provision shall be made for storage and disposal of hazardous materials.</p> <p><b>Advisory:</b> The area should be adjacent to stores, packaging, and dispensing.</p>
13	Purchasing/receiving/storage	Varies; provide clear circulation aisles of not less than	<p><b>Mandatory:</b> a) Work surfaces and counters shall be provided. b) If the area is accessed from outside the services, alarm monitoring and card control shall be provided. c) A shelving system shall be provided for storage. d) Refrigerators shall be provided.</p>

*(Continued)*

**Table 9.12 (Concluded)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
		900 mm wide	<ul style="list-style-type: none"> <li>e) A clerical workstation, with computer and shelving, shall be provided.</li> <li>f) Provision shall be made for a break-out area and container recycling.</li> <li>g) A telephone, fax, and printers shall be provided.</li> <li>h) A bar-code scanner shall be provided.</li> <li>i) Space shall be provided for staging and returns.</li> <li>j) A filing system shall be provided.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Adjacencies to compounding, packaging, and the storage of narcotics and controlled substances should be considered.</li> <li>b) A hand hygiene sink and emergency eyewash should be considered.</li> </ul>
14	General dispensing area	Varies; assume 750 mm deep counter with minimum 1500 mm length for each task	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Dispensing counters shall be provided.</li> <li>b) Computer, printers, and telephones shall be provided.</li> <li>c) Provision shall be made for supply storage.</li> <li>d) Access shall be provided to a hand hygiene sink and emergency eyewash.</li> <li>e) Refrigerators and freezers shall be provided.</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) The area could be adjacent to picking stations, order entry, and the pneumatic tube station.</li> <li>b) Secure pick-up area should be provided.</li> </ul>
15	Night cupboard	Varies; not less than 4.6, 10.0 if an automated dispensing unit is used	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The cupboard shall function as a small central pharmacy for access to non-stock items.</li> <li>b) Secure access shall be provided.</li> <li>c) A secure area with a separate lock shall be provided for storage of controlled drugs within the secure space (i.e., night cupboard or medication room).</li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) An ADU should be considered.</li> <li>b) The cupboard should include a refrigerator.</li> <li>c) The night cupboard should be central to 24 h inpatient units.</li> </ul>
16	Drug information room	Varies; not less than 10.0. Assume 4.6 for each workstation and additional circulation space	<p>See Clause 11 for common requirements and recommendations for a primary communication station.</p> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) Furniture workstation carrels should be considered.</li> <li>b) Audio-visual equipment and videoconferencing capability should be considered.</li> </ul>

## 10 Support functional services requirements

### 10.1 Biomedical engineering

#### 10.1.1 Description

##### 10.1.1.1

Biomedical services are responsible for maintaining medical equipment and providing education and training on the correct and safe use of electromedical equipment, as well as maintaining close working relationships with materials management, clinical staff, the information technology (IT) services, and vendors. The size and scope of the biomedical engineering department will vary depending on the type of facility.

Examples of the services generally provided by biomedical services within an acute care HCF include

- a) medical equipment identification, evaluation, and specifications;
- b) advising on procurement of clinical equipment;
- c) installation including inspection, testing, and documenting of new incoming medical equipment before it is put into service which may include training by equipment vendors;
- d) compliance and verification of standards and codes;
- e) emergency repair;
- f) investigation of equipment problems;
- g) routine inspections calibrations and preventative maintenance;
- h) maintaining records of repairs;
- i) tracking emerging technologies;
- j) storage of impounded equipment;
- k) consultation on equipment to clinical and other services;
- l) monitoring alerts/hazards; and

**Note:** The ECRI Institute ([www.ecri.org](http://www.ecri.org)) is a nonprofit organization that evaluates health technologies. Among its services it offers a web-based, automated alerts management system that promotes patient safety by electronically distributing vital safety information about medical devices, blood products, food products, and pharmaceuticals to the appropriate staff.

- m) essential support during emergency situations such as a power failure or outbreak.

##### 10.1.1.2

Additional services that can be provided by biomedical services in an acute HCF, depending on local conditions, include

- a) management of contracts for outsourced service providers;
- b) education and training on the correct and safe use of equipment;
- c) transporting equipment to the biomedical services shop for repair;
- d) managing a facility-wide electronic inventory management system; and
- e) outsourcing services to other facilities.

#### 10.1.2 Functional requirements

##### 10.1.2.1

The services shall be in close proximity to elevators, the receiving area, and an exit to allow convenient egress for external servicing requirements.

Decentralized workshops may be used where there are significant workload demands.

**10.1.2.2**

A separate storage room shall be provided for inventory and shall be located within easy access from the workshop area.

A holding area shall be provided for both components and equipment that are not being used or are waiting for repair.

A customer service area should be the first point of access, with a separate entrance for accepting equipment.

An eyewash station shall be located within the services.

**10.1.3 Technical requirements****10.1.3.1 General****10.1.3.1.1**

Biomedical engineering services shall be designed so that the movement of typical electromedical and medical equipment by HCF staff and biomedical engineering staff does not interfere with the efficient and effective operation of the HCF.

**10.1.3.1.2**

All biomedical engineering services rooms shall be lockable.

**10.1.3.1.3**

Each technologist's workbench, including the receiving and cleaning area, shall be equipped with

- a) piped compressed air, oxygen, and medical vacuum for servicing and testing of equipment; and
- b) a scavenging system for anaesthetic equipment, chemical vapour, solder fumes, etc.

(see CSA Z7396.1).

**10.1.3.1.4**

Fume hoods with appropriate ventilation shall be provided at mechanical workbenches in the workshop area.

**10.1.3.1.5**

Benches shall be designed to support heavy equipment loads. Work surfaces shall be highly durable and drip- and stain-resistant.

**10.1.3.1.6**

Biomedical engineering workshops and satellites shall be protected from electromagnetic interference (see CAN/CSA-Z60601 Series).

**10.1.3.1.7**

Task lighting shall be provided above the benches. Additional lighting shall be provided to support repair work performed on the floor nearby.

**10.1.3.1.8**

A satellite service shop should be considered as part of the surgical suite department, critical care, medical imaging, and dialysis.

**10.1.3.1.9**

Satellite workshops shall be equipped with a floor drain.

**10.1.3.1.10**

Satellite areas shall be equipped with medical vacuum, medical air, nitrous oxide, anaesthetic gas scavenging system, and oxygen.

**10.1.3.1.11**

Satellite workshops should be equipped with appropriate ventilation, sinks, and compressed air.

**10.1.3.2 Acoustics**

The noise level shall be controlled to ensure a comfortable environment.

**10.1.3.3 Natural lighting**

All workplaces should have natural lighting or easy access to natural lighting.

**10.2 Environmental services****10.2.1 Description****10.2.1.1**

Environmental services provide full service cleaning and waste removal for all inpatient, outpatient, and administrative areas, and for HCF-affiliated buildings on site.

**10.2.1.2**

Linen and laundry services can be part of other services and may, for the most part, be outsourced. However, on-site laundry processing areas could be required for specialty items. This service may also provide patient laundry services. Provision for back-up/emergency supplies shall be provided.

**10.2.1.3**

Services generally provided by environmental services (housekeeping and linen) in an acute care HCF, inpatient continuing care/rehabilitation centre and mental health facility include

- a) routine daily cleaning, as well as reactive cleaning to address ad hoc situations in all areas, including isolation areas;
- b) project cleaning of all areas on a basis that is neither routine nor reactive, but where notice can be given of special cleaning situations and timing of cleaning can remain flexible (e.g., deep cleaning of certain items);
- c) outbreak cleaning (i.e., special cleaning duties necessary to contain and eliminate an infection outbreak);
- d) some equipment cleaning;
- e) replenishing supplies (eyewash stations, hand hygiene sinks, cleaning chemicals, etc.);
- f) floor mat cleaning service (in-house or contract, with management of outsourced service);
- g) flood remediation;

- h) holding and managing soiled linen and all waste and waste streams, including
  - i) shredding;
  - ii) recyclables;
  - iii) composting;
  - iv) chemical;
  - v) biological; and
  - vi) radiation;
- i) discharge cleaning;
- j) drapery/curtain, furniture, and upholstery cleaning; and
- k) responsibility for the distribution of OR scrubs.

#### **10.2.1.4**

Depending on local conditions, environmental services (housekeeping and linen) also provide additional services, including

- a) patient laundry;
- b) transporting waste and recyclable materials from the soiled utility rooms throughout the facilities to a central holding area;
- c) supplying, cleaning, and hanging draperies, window coverings, and cubicle/privacy curtains;
- d) responsibility for the distribution of clean linen to the clinical areas;
- e) transporting linen and garbage;
- f) room set-up, including audio-visual set-up, furniture and office moves, and equipment storage;
- g) advice/input into all purchases of upholstered products;
- h) management, which may include delivery and pick-up, of specialty mattresses, equipment, slings, etc.;
- i) services for community-based providers, if they are part of the organization;
- j) furniture storage;
- k) bed storage;
- l) distribution of staff uniforms;
- m) collection of soiled linen and waste from all inpatient bedrooms and transportation to soiled holding rooms (may also be performed by on-unit/multi-skilled person) and transportation to waste holding areas in the soiled loading dock area;
- n) pest control (sometimes a contracted service);
- o) disposal of capital assets;
- p) stocking of disinfectants, infection control supplies, etc.;
- q) light bulb changing;
- r) window cleaning;
- s) office accommodations (room booking);
- t) preventative maintenance on housekeeping equipment;
- u) contract management;
- v) limited grounds keeping within (10 to 15 m) of the entrance (alternatively, this may be provided by plant maintenance staff); and
- w) minor repairs (paint touch-ups, curtains, etc.).

#### **10.2.2 Functional requirements**

##### **10.2.2.1**

Because of the need for regular communications between services, consideration should be given to

keeping the following services in reasonably close proximity or at least to establish efficient means of communications (e.g., two-way pagers, wireless handheld device communication):

- a) forwarding of lost and found articles to security services; and
- b) taking in/closing calls logged in to central help desk services.

#### **10.2.2.2**

The services should be planned to support the following workflow:

- a) receiving/holding (awaiting repair);
- b) cleaning/clean hold;
- c) work area;
- d) parts storage; and
- e) equipment holding while awaiting pick-up.

#### **10.2.2.3**

The housekeeping space shall include the following zones:

- a) the supervisor and managers offices/administrative support;
- b) staff sign-in area; and
- c) training space/workplace hazardous materials information system (WHMIS) area (if required).

Storage areas for environmental services equipment shall be easily accessible to the services and to the service elevators.

Central linen holding areas shall be directly adjacent to the receiving dock.

The laundry processing area should be collocated with the linen room and shall include areas for cart make-up and back-up storage.

Space should be allocated for equipment storage, and such space shall be directly adjacent to the housekeeping services.

Space shall also be allocated to store physical or electronic copies of SDSs, which shall be kept onsite in accordance with WHMIS and applicable requirements.

*Note: Provincial/territorial regulations can apply.*

A staff washroom and staff facilities should be located directly adjacent to the administrative offices.

#### **10.2.3 Technical requirements**

##### **10.2.3.1**

The movement of soiled, infectious, hazardous, or otherwise unsafe goods and materials by environmental services staff shall ensure efficient and effective operation of the HCF and the safety of patients, the public, and HCF staff.

Environmental services shall conform to the applicable requirements for the use and storage of hazardous materials within the HCF and on the HCF site.

*Note: Federal and provincial/territorial regulations can apply.*

##### **10.2.3.2**

Housekeeping carts and chemicals shall be lockable and, when not in use, be stored in housekeeping rooms/closets.

Decentralized housekeeping rooms shall be designed to accommodate storage of supplies and equipment — such as cleaning carts, polishers, and medical vacuums — and include water supply, a hand hygiene sink, hopper sink, space to park and plug in equipment, cupboards/shelving to store supplies, and a pre-mixed, automatic system for dispensing chemical supplies.

Waste handling area (materials management) shall be designed to accommodate the different waste streams: general, biomedical, recyclable, food, chemical, etc.

Safety against fire, odour, and pests shall be provided, and cross-contamination by infectious materials shall be avoided. Biomedical waste shall be managed in accordance with CSA Z317.10.

#### **10.2.4 Occupational health and safety**

Environmental service areas shall be designed to minimize the manual movement of goods and materials. Where manual pushing of dollies and carts is required, distances should be minimized by considering the location of the loading docks, storage, and elevators to units.

### **10.3 Nutrition and food services**

#### **10.3.1 Description**

##### **10.3.1.1**

The food services are responsible for all nutrition in the HCF, serving both patients and non-patients. Food delivery models can vary significantly between organizations and the field continues to evolve with the emergence of new delivery models. Each organization will need to determine the most appropriate delivery model and plan accordingly. Clause 10.3.1 provides general guidance typical for all models, but does not describe specific requirements. The principles for hazard analysis critical control point (HACCP) should be used when selecting finishes in food production and storage areas including ease of sanitizing and degreasing surfaces.

##### **10.3.1.2**

Food delivery models can include

- a) room service (food delivered on demand);
- b) tray service (cold plated or hot plated);
- c) bulk; and
- d) "catering to you" (meals plated at bedside).

##### **10.3.1.3**

Services in an acute HCF, inpatient continuing care/rehabilitation centre, and mental health facility generally include

- a) menu planning, food procurement, food preparation/production, meal assembly, and delivery to patient units and/or on-unit dining room serveries;
- b) contract management of outsourced service providers;
- c) waste removal;
- d) warewashing, cart washing, and food service-related waste management;
- e) nourishments to pantries throughout the HCF;
- f) catering, internal and external;
- g) clinical nutrition services (other than dietician services);
- h) late night meal service, as required; and
- i) special dietary needs.

#### **10.3.1.4**

Retail food services for visitors, outpatients, and staff in an acute HCF, inpatient continuing care/rehabilitation centre, and mental health facility can include

- a) preparation, production, and service of food and beverage products for staff and visitors;
- b) a central cafeteria servery and seating area;
- c) a branded or unbranded food and beverage outlet(s) (may serve coffee, food, etc.); and
- d) vending area(s).

#### **10.3.1.5**

Food services in an acute HCF, inpatient continuing care/rehabilitation centre, and mental health facility may, depending on local conditions, provide additional services, including

- a) clinical and therapeutic diets;
- b) food purchasing and receiving;
- c) food services equipment purchasing;
- d) food services equipment repairs and cleaning;
- e) cleaning of all food areas;
- f) additional vending machines in high-traffic areas including, but not limited to, emergency, outpatient clinics, etc.;
- g) input into specifying equipment and food safety for all food areas, such as activities for daily living (ADL) kitchens and kitchenettes;
- h) community relations/services to community groups, such as meals-on-wheels, meals to detoxification facilities, etc.;
- i) snack/tea services to inpatient bedrooms (could be provided by volunteers); and
- j) dietician services.

### **10.3.2 Functional requirements**

#### **10.3.2.1**

Requirements (space, internal adjacencies/planning) vary according to the HCF's food delivery model.

Space should be planned to reflect the following workflow:

- a) food receiving;
- b) storage;
- c) pre-preparation;
- d) preparation;
- e) production;
- f) holding (refrigerated); and
- g) patient.

Office space should be provided for administration, menu planning, etc.

#### **10.3.2.2**

The receiving dock shall open directly to the bulk storage area and the refrigerated/freezer storage areas. Deliveries shall not pass through the food production areas.

Planning for the handling of all soiled materials shall reflect the following workflow:

- a) patient;
- b) dish room (including dedicated space for waste); and
- c) cart wash.

**10.3.2.3**

The pot wash and dish room areas shall be separate rooms and be designed to reduce noise within the rooms and the migration of sound outside the rooms.

**10.3.2.4**

Retail outlets and vending machines shall be in a location that encourages their use and allows for efficient food and money resupply and rotation without encumbering traffic flow.

**10.3.3 Technical requirements****10.3.3.1 General****10.3.3.1.1**

An eyewash station shall be provided near chemical dispensation areas.

**10.3.3.1.2**

Special ventilation and heat removal shall be provided for the kitchen area.

**10.3.3.1.3**

Space for food service carts through the entire HCF shall be provided.

**10.3.3.1.4**

Space shall be provided at the plate-scraping station to separate and store waste streams into organic, recyclable, and garbage.

**10.3.3.1.5**

For operational efficiency, the use of an oven that accommodates roll-in carts should be considered.

**10.3.3.1.6**

The operational and space implications for the provision of three days' pandemic supply of all products should be considered. Longer periods should be planned for in remote areas or where supplies could be delayed by weather, natural disasters (fire or flood), or terrain.

**10.3.3.1.7**

A locked chemical storage area with a chemical dispensing system (e.g., for dishwashing equipment), separate from the food storage area, should be considered.

**10.3.3.1.8**

Personal patient food shall be stored separately from food purchased by foodservices department.

**10.3.3.1.9**

Decentralized food serveries shall be lockable, and locked when not in use by food service personnel.

**10.3.3.2 Occupational health and safety**

Occupational health and safety provisions in nutrition and food services shall include the following:

- a) Environmental control for noise and air conditioning shall be provided.
- b) General and task lighting shall be adequate and provided over the work areas.

- c) Increased ventilation and acoustical isolation shall be provided for the dishwasher and pot washing rooms.
  - d) The walls, ceilings and floors shall be washable and moisture-impervious.
  - e) The floors shall be non-slip.
  - f) Depending on the operation model, special ventilation, space, and electrical requirements should be provided in accordance with CAN/CSA-Z317.2.
  - g) Functional and storage space shall be provided for chemicals used in the unit.
  - h) Eyewash facilities shall be provided when chemicals are being used.
  - i) Kitchen class "K" fire suppression systems shall be provided in accordance with applicable requirements.
- Note:** Provincial/territorial regulations and bylaws can apply.
- j) Dishwashing areas shall be designed to minimize lifting, pushing, pulling, and carrying.
  - k) Ergonomics principles shall be applied to the design of work areas (e.g., heights) and equipment selection (e.g., size and weight of carts).
  - l) Flammable storage cabinets should be included for both new and used cooking oils.
  - m) Chemicals (e.g., fuel for heating trays) shall be stored separately.
  - n) Space for the storage of PPE shall be provided near the storage location of chemicals.

## 10.4 Materials management

### 10.4.1 Description

#### 10.4.1.1

Materials management arranges for the procurement, receipt, and supply of most goods used by the programs and services in the HCF. Within their quality control standards, the services provides an area for receiving, storing, and inventory control of incoming and outgoing materials used in acute, mental health, rehabilitation, and chronic care facilities.

The services generally provided by the materials management services in an acute HCF, inpatient continuing care/rehab centre, and mental health facility include

- a) purchasing (acquisition of capital and supplies);
  - b) standardization of services and products;
  - c) maintaining stock inventory or appropriate safety stock levels in the event of just-in-time (JIT);
- Note:** Inventory space decisions should take into account catastrophic event management planning and the need for backup supplies of items that could be difficult to obtain in an emergency (e.g., masks and PPE).
- d) requisition and distribution of medical/surgical supplies;
  - e) shipping and receiving;
  - f) stores;
  - g) procurement and stocking of specialty supplies, such as pandemic supplies, chemicals, and biological and radiation materials; and
  - h) storage for flammables.

#### 10.4.1.2

Depending on local conditions, materials management provide additional services, including

- a) time-sensitive and reliable portering, including a standard schedule as well as rush/emergency capabilities;
- b) a short-term holding area for surplus equipment;
- c) responsibility for archive storage for inactive health, finance, laboratory, diagnostic imaging, and other records (may be outsourced);

- d) storage of back-up patient equipment, such as beds, bassinets, and wheelchairs, and management and disposal of surplus equipment;
- e) sorting and delivery of incoming mail and internal correspondence, pick-up and metering of outgoing mail, receiving and shipping of courier packages, and delivery of small courier packages internally;
- f) input into furniture selection and layout;
- g) printing;
- h) transportation;
- i) courier services between sites;
- j) providing materials management services to other organizations such as physicians and community care access centres (CCACs);
- k) disposal of hazardous waste materials; and
- l) maintenance of stored equipment such as wheel chairs, stretchers, and related accessories and easily accessible to portering; an example is matching accessories to the correct equipment by knowledgeable staff so it is ready for safe use.

## **10.4.2 Functional requirements**

### **10.4.2.1**

The services should be planned to support the following workflow:

- a) receiving/holding (awaiting repair);
- b) cleaning/clean hold;
- c) work area;
- d) parts storage; and
- e) equipment holding while awaiting pick-up.

### **10.4.2.2**

The mailroom, inventory control office, and print shop should be in close proximity to the materials management administrative offices.

### **10.4.2.3**

The waste-handling area shall include a dock compactor, dock for general use, recycling areas, cardboard area, a refrigerated waste holding and cart washing area, and a confidential waste holding area.

### **10.4.2.4**

The clean receiving/shipping area shall be separated from the soiled receiving/shipping area. In clean work areas, to avoid contamination, materials shall flow from clean to soiled.

In planning for soiled materials, the materials shall flow from soiled to a wash area, then to a clean storage area.

### **10.4.2.5**

A receiving/inspection work area shall be located adjacent to the clean receiving areas.

### **10.4.2.6**

The bulk stores areas should be directly adjacent to the receiving area. Unit supplies shall be adjacent to bulk stores.

**10.4.2.7**

In acute care hospitals, a separate enclosed entrance shall be provided for morgue traffic.

**10.4.2.8**

Space should be allocated for supplies in accordance with catastrophic event management planning adjacent to the receiving area.

**10.4.2.9**

There shall be accommodation for off-hour service deliveries, as well as a refrigerated storage area.

**10.4.2.10**

There shall be a receiving office/work area with a view of the docks if physical plant allows. Offices should be consolidated in one suite within the materials management area.

**10.4.2.11**

Storage rooms for flammable and combustible liquids, and tanks of medical gases, shall be located adjacent to the receiving areas.

**Note:** *The HCF should develop a hazard assessment for this area and its contents, particularly if located near critical HCF infrastructure.*

**10.4.2.12**

An area for vendor representatives and a resource area shall be provided directly adjacent to the materials administrative offices.

**10.4.2.13**

The cart marshalling area shall be close to the service elevators.

**10.4.3 Technical requirements****10.4.3.1 General****10.4.3.1.1**

The movement of typical goods and materials, as well as large, soiled, infectious, hazardous, or otherwise unsafe goods and materials, by building, engineering, and maintenance staff or staff associated with the operations and functions of this services shall not put at risk the efficient and effective operation of the HCF or compromise the safety of patients, the public, or HCF staff.

Materials management shall conform to applicable requirements for the use and storage of hazardous materials within the HCF and on the HCF site.

**Note:** *Federal and provincial/territorial regulations can apply.*

**10.4.3.1.2**

Separate service elevators shall be provided within the HCF for the transportation of materials, promotion of operational efficiencies, and provision of an appropriate environment for patients and the public.

**10.4.3.1.3**

Planning for the materials management area shall be in compliance with CAN/CSA-Z314.

**10.4.3.1.4**

Each receiving bay shall be equipped with a levelling device.

**10.4.3.1.5**

A scissor lift or ramp, fully adjustable between ground and dock, should be provided in at least one bay to facilitate the movement of goods.

**10.4.3.1.6**

A meeting room should be provided close to the receiving docks.

**10.4.3.2 Occupational health and safety**

Provisions for occupational health and safety shall include the following:

- a) Functional and storage space shall be provided for chemicals used in the unit.
- b) Vehicle exhaust gases shall not interfere with building ventilation system intakes in the receiving/shipping docks area.
- c) All floors shall have a highly durable, easy-to-clean surface.
- d) There shall be storage space for spill clean-up kit storage.
- e) The dock area should be provided with climate control.
- f) The dock area should be provided with easy-to-clean, slip-resistant surface.
- g) Consideration should be given to heated floors.
- h) Functional and storage space shall be provided for patient handling devices.
- i) Eyewash facilities shall be provided when chemicals are being handled.
- j) Ergonomics shall be considered in the design of work areas (e.g., heights) and equipment selection (e.g., size and weight of carts).
- k) Materials management areas shall be designed to minimize the manual lifting, lowering, pushing, pulling, and carrying of items.

*Note: OH&S can be improved in the mail room, print shop, receiving/shipping, and loading docks through careful layout and design and provision of manual handling aids such as rollers, conveyors, lift devices, levelling devices, and vertical or horizontal transport systems.*

**10.5 Plant maintenance****10.5.1 Description****10.5.1.1**

Physical plant management services provide operation and maintenance of the HCF, including the building and all plant systems and installed equipment, and excluding electronic and sensitive medical equipment.

The department is tasked with the governance of the physical plant assets. This encompasses the infrastructure in its entirety and a mandate to provide a safe and healthy environment for its staff occupants and patients.

The management team holds a membership or may lead on committees in the areas of occupational health and safety, infection prevention and control, leadership teams, catastrophic event management,

project planning, capital development, construction, space planning, and other committees and governance groups that could be applicable or have impact on the facility or its operation.

The department is responsible for the acquisition and conservation of utilities and other related commodities to insure sustainment of the physical plant.

The management of the physical plant encompasses a broad range of systems and components, many of which are covered by CSA standards and by regulatory requirements. A preventive maintenance management system is employed to carry out the tasks required to maintain the equipment in good operating order within the various systems. These include building envelope components and architectural finishes, grounds, electrical distribution and infrastructure, medical gases, air, and fluid transfer distribution and storage systems, HVAC systems, boiler, hot water, steam, and sterilization systems and distribution, life safety systems such as fire alarm, nurse call, code blue, and auxiliary communication systems, security systems, plumbing, elevators, refrigeration, and other related systems.

The maintenance and management of equipment within the envelope of the physical plant may include a wide range of specialized equipment required by clinical and support departments. The plant services department should provide input and approval of all equipment that may have an impact on the facility or a requirement for maintenance or operation.

### 10.5.1.2

Services provided by the plant maintenance services can include

- a) management, maintenance, and control of
  - i) site property, grounds, irrigation, drainage, fencing, signage, lighting, parking, auxiliary buildings, utility service corridors systems, and public areas management and maintenance;
  - ii) facilities exterior, building envelope, foundations, roof systems, and utility services building connections from demarcations;
  - iii) facility interior walls, architectural finishes, floors, ceilings, and structural components;
  - iv) building operational services systems, building operating components, and physical plant maintenance (e.g., doors, hardware, key control, elevators, signage, loading docks, air tube systems, kitchen services, elevators, sterilization, rolling stock, beds, etc.);
  - v) primary electrical transformation and distribution systems and secondary electrical distribution systems;
  - vi) emergency power generation, distribution, and uninterrupted power supply systems;
  - vii) lighting systems and controls;
  - viii) nurse call, code call, intercoms, and other audio communication systems;
  - ix) life safety alarming, monitoring, and protection systems;
  - x) HVAC generation, distribution, and systems;
  - xi) quality air and ventilation systems distribution, control and maintenance (i.e., HEPA, AIRs, computer rooms, and other specially ventilated areas);
  - xii) plumbing and water treatment systems (e.g., demineralization, ultraviolet, filtration systems);
  - xiii) fire suppression sprinkler, stand pipe, and fire hydrant systems;
  - xiv) medical gases distribution, bulk storage, and generation systems;
  - xv) special and waste water collection systems, including CBRNE underground storage tanks and related plumbing for extraction/decontamination;
  - xvi) steam and heating systems distribution and maintenance; and
  - xvii) hazardous waste and flammable storage;
- b) statutory testing;
- c) fire prevention and safety;

- d) supervision/coordination of work requiring specialized training/outsourced services, such as elevators and medical gases;
- e) organized maintenance tasks, including
  - i) preventive maintenance, intended to actively reduce the risk of on-demand maintenance;
  - ii) corrective (or on-demand) maintenance, which are unplanned activities to correct, repair, replace, or refurbish the facilities; and
  - iii) predictive maintenance, which uses specialized tests (vibration, thermography, etc.) to predict the need for maintenance of certain equipment within the facilities; and
- f) life cycle replacement and refurbishment.

#### **10.5.1.3**

Depending on local conditions, plant maintenance services offer additional services, such as

- a) electrical;
- b) plumbing;
- c) carpentry (including millwork);
- d) locksmithing;
- e) IT physical infrastructure maintenance and management;
- f) call centre/help desk operations;
- g) medical gas systems maintenance;
- h) maintenance and repairs to mechanical equipment and systems for
  - i) laundry;
  - ii) water treatment;
  - iii) kitchens;
  - iv) vertical transport;
  - v) refrigeration;
  - vi) conveying systems;
  - vii) steam generation (i.e., boilers and distribution systems);
  - viii) device cleaning and sterilization equipment (e.g., sterilizers, washer-disinfectors);
  - ix) nurse call systems; and
  - x) monitoring systems for wandering and for infant protection;
- i) painting and minor projects;
- j) assessment and/or repair of building infrastructure, including
  - i) facility fabric, internal and external;
  - ii) exterior furniture and structure;
  - iii) fixtures and fittings;
  - iv) floor and floor covering; and
  - v) decorative finishes;
- k) grounds keeping, including snow removal;
- l) window washing;
- m) project planning and capital redevelopment;
- n) flood remediation (including work on sumps, pits, and drains);
- o) parking lot maintenance and operations;
- p) furniture/non-medical equipment repairs (including holding area);
- q) welding;
- r) maintenance of in-house wayfinding systems;
- s) construction project management;
- t) providing support to HCF emergency code response teams;
- u) assisting in planning emergency preparations;

- v) physiotherapy and occupational therapy equipment repairs and servicing (specialized aids, ceiling lifts, etc.);
- w) maintenance and repairs to clinical equipment (e.g., wheelchairs, beds); and
- x) coordination of wheelchair and stretcher inventory which can also be coordinated with materials management services.

**Note:** For example, repairs are usually completed by maintenance, and accessory matching by materials management and clinical resources.

## **10.5.2 Functional requirements**

### **10.5.2.1**

The design of the HCF shall provide sufficient space for the plant maintenance personnel and their supervisors to carry out their assigned tasks, as well as storage and workshop areas to house the required tools and equipment to carry out these tasks effectively.

### **10.5.2.2**

The services should be planned to support the following functions:

- a) facilities management supervision and operations, including work areas for the call centre/help desk, computerized maintenance management system (CMMS) including consideration for the daily coordination of work requests between call centre/plant maintenance staff/building occupants (100's per day in an average acute care hospital), and building automation system (BAS) operation and maintenance;
- b) contractor holding, where contractors will come in to get specific work orders, work instructions, and receive training if performing special work or work in facility areas that require special procedures;
- c) project management for retrofit/refurbishment and life cycle work performed throughout the site, including work areas and drawings cabinets to keep current as-built and ongoing project drawings for the facility;
- d) work areas for mechanical, electrical, electronic, carpentry, locksmith, and hot work;
- e) training and induction of new plant maintenance staff and/or outside contractors; and
- f) catastrophic event management.

### **10.5.2.3**

Workflow should be planned as follows:

- a) receiving/holding (awaiting repair);
- b) cleaning/clean hold;
- c) parts and tools storage; and
- d) equipment holding while awaiting pick-up.

### **10.5.2.4**

A staff washroom and staff facilities should be located directly adjacent to the plant maintenance offices.

### **10.5.2.5**

Plant maintenance spaces shall be easily accessible for staff with disabilities.

### 10.5.2.6

The following provisions shall apply:

- a) The manager's office shall be located within the plant maintenance services.
- b) The plans room shall be located within the services.
- c) The main services shall consist of a general office for clerical staff and storage, a call centre, offices, plans rooms, specialty workshops, and storage/holding areas.
- d) A multi-use office close to the services should be provided for contractors and other service personnel.
- e) Workshops shall be located close to the equipment holding area.
- f) The welding and/or painting area shall be situated against an outside wall.
- g) A shower/change area and washroom should be provided close to the workshops.
- h) The maintenance garage/grounds areas should be located in a location central to the services it provides, with satellite service boxes at every entrance.
- i) An inventory storage room for parts and materials shall be provided adjacent to the workshops or within the workshop area.

### 10.5.3 Space details

#### 10.5.3.1 General

The space requirements within the plant maintenance workspace vary according to HCF size, design constraints, and the services that plant maintenance will provide to the HCF, but in general Clauses 10.5.3.2 to 10.5.3.8 should be taken into account.

#### 10.5.3.2 Facility manager's office

The facility manager's office shall

- a) provide a quiet space to work, with privacy as required for human resources and customer meeting requirements;
- b) accommodate a group of up to 6; and
- c) be positioned to give a view of entries and protected storage areas.

#### 10.5.3.3 Open area offices

Staff work in open area offices shall each be provided with a cubicle with a minimum of 11 m<sup>2</sup> of workspace.

**Note:** Examples of these individuals include administrative assistants, computerized maintenance management system (CMMS) operators, and building management systems (BMS) operators.

Hotel stations shall be planned for recurring visitors, in a number that is adequate to meet the needs. They shall be of smaller size than cubicles for regular employees, at about 6 m<sup>2</sup> each.

An open area shall be provided, with storage and a table large enough to allow the roll out of as-built or project drawings.

Workspace for project teams shall also be provided for use in building and equipment life cycle planning, replacement, and upkeep. To allow for easy circulation, an area of 50–60 m<sup>2</sup> shall be planned for this purpose.

Additional space shall be planned to allow easy circulation around the different work areas mentioned above.

#### **10.5.3.4 Multi-purpose room**

Space shall be provided for the purposes of training, staff orientation, meetings, and (if needed) a lunch room. The area shall be sized in accordance with anticipated use. Provision for presentations and/or video viewing should be provided. This space may also be designated for repurposed use during catastrophic event management situations.

If used as a lunch room, the area should provide sufficient seating at tables and allow for minor meal preparation and cleanup of kitchen utensils, etc. In general, an area of 20–30 m<sup>2</sup>, depending on the number of people to house, shall be sufficient to meet these needs.

#### **10.5.3.5 Workshops**

Workshop areas will be used for equipment, material, and tools to perform repairs or to fabricate parts. Some areas are used for all hot work and others to allow refrigeration mechanics, maintenance mechanics, millwrights, plumbers, electricians, locksmiths, and carpenters to bring in equipment that cannot be repaired in place.

Clean areas should be provided for work on smaller and/or dust sensitive equipment such as circuit boards, computer equipment, electronic door opening devices, electronic/mechanical locks, etc.

Servers for the building automation system (BAS) system may be located in this area to allow controlled, yet easy access by the appropriate plant maintenance staff.

Approximately 80 m<sup>2</sup> should be planned for workshops, with the general workshop area larger than the clean workshop because of the size equipment and greater number of interventions that are usually performed in those spaces.

#### **10.5.3.6 Storage**

Storage areas generally hold large material that the plant maintenance staff need (e.g., lengths of copper pipe, vinyl rolls, spare doors, panes of glass, etc.). They are also used for the storage of large tools that any of the trades might use, and service carts required by the plant maintenance staff.

Separate areas should be designed for storage of flammable items, paint, compressed gases (e.g., nitrous oxide, oxygen, propane), chemicals etc. These areas shall have their specific exhaust with an alarm in compliance with BAS, as well as specific cabinets for these uses.

Depending on the size of the HCF and plant maintenance services performed, approximately 60–75 m<sup>2</sup> should be planned for storage.

#### **10.5.3.7 Washrooms and change room**

Washrooms and change rooms shall be provided to allow plant maintenance staff to lock personal items in a cabinet and to store coats, hats, boots, etc.

#### **10.5.3.8 Miscellaneous areas within plant maintenance workspace**

Circulation areas around each of the locations described in the previous clauses shall be planned in the design of the HCF and shall meet with the requirements of the most recent edition of CSA Z317.11.

## 10.5.4 Technical requirements

### 10.5.4.1 General

The movement of typical goods and materials, as well as large, soiled, infectious, hazardous, or otherwise unsafe goods and materials, by building, engineering, and maintenance staff shall not put at risk the efficient and effective operation of the HCF or compromise the safety of patients, the public, or HCF staff.

The functions of the building, engineering, and maintenance services shall conform to applicable requirements for the use and storage of hazardous materials within the HCF and on the HCF site.

*Note: Federal and provincial/territorial regulations can apply.*

### 10.5.4.2 Acoustics

The noise level shall be controlled to ensure a comfortable environment.

### 10.5.4.3 Lighting

Plant maintenance spaces are typically located in areas of the HCF where natural lighting or easy access to natural lighting are difficult to achieve. Careful consideration shall therefore be given to appropriate lighting levels, with supplementary task lighting installed where appropriate.

### 10.5.4.4 Odour

The following standards apply to all public areas and shall be addressed in planning and design:

- a) Odour control and adequate air for groups of people shall be provided.
- b) Directional airflow (related to the control point) shall be used to protect staff when the public areas are used as a screening point in an outbreak situation.

## 10.5.4.5 Materials and finishes

### 10.5.4.5.1 General

In addition to the general requirements for materials and finishes as specified in Clause 7.2, the provisions in Clause 10.5.4.5 shall be made.

### 10.5.4.5.2 Concrete surfaces

Concrete surfaces shall be sealed.

### 10.5.4.5.3 Ceilings

In workshops, storage, and loading dock areas, ceilings shall be exposed ceiling-painted.

### 10.5.4.5.4 Walls

Walls shall be durable and scrubbable.

### 10.5.4.5.5 Floors

In areas of high traffic and/or heavy load that require easy cleaning, poured epoxy or good quality sheet vinyl should be used. These areas include contractor hosting, training/induction/lunch room, and washrooms/change rooms.

#### **10.5.4.5.6 Doors and door protection**

Doors providing access to the plant maintenance workspace from other locations, as well as those inside the workspace, shall be durable and impact resistant and protected by kick plates. Depending on the configuration, consideration should be given to the use of double doors for areas that will need to house larger equipment for repair and refurbishment, such as general storage and workshop, as well as plant maintenance staff entrance to the plant maintenance workspace.

#### **10.5.4.6 Occupational health and safety**

Provisions for occupational health and safety shall be as follows:

- a) services shall be designed to provide appropriate ventilation and dust control;
- b) adequate general lighting and task lighting shall be provided;
- c) service switches and valves for equipment should not be located in confined spaces; and
- d) fall protection barriers should be installed around all equipment that will require servicing.

#### **10.5.4.7 Furniture, fittings, and equipment**

##### **10.5.4.7.1**

Furnishings, fittings, and equipment shall be standardized as much as possible in the support and administrative areas.

##### **10.5.4.7.2**

Workshops shall include

- a) workbenches with ample cupboard space;
- b) a whiteboard;
- c) tools storage cabinet; and
- d) an eyewash and shower.

##### **10.5.4.7.3**

A fume hood shall be provided to capture all exhaust fumes and a curtain shall be installed to isolate the welding area (if hot work is performed).

##### **10.5.4.7.4**

Servers shall be located in the clean section of the workshop (or separate clean workshop). A lockable, well-vented server cabinet shall be installed.

##### **10.5.4.7.5**

Storage shall include appropriate shelving systems.

##### **10.5.4.7.6**

Washroom and change room shall include

- a) lockers, bench seating, and hooks appropriate to the number of plant maintenance technical staff; and
- b) the appropriate number of toilets, urinals, and showers provided with sink, soap dispenser, paper towel dispenser, etc.

**10.5.4.7.7**

Depending on the anticipated types and quantities of equipment and materials that will be received, shipped, and moved, designated areas within the plant maintenance workspace should be provided with loading docks equipped with a shelving unit and a lift bay.

**10.5.4.7.8**

Hoists and lifts should be considered for selected stairwells, for the moving of heavy equipment to roof and penthouse levels.

**10.5.4.7.9**

The meeting area shall have a table and chair to accommodate small meeting groups.

**10.5.4.8 Technology considerations**

Information desks/boards/kiosks shall be located in a direct line of sight with the entrance.

**10.5.4.9 Safety and security**

Safety and security provisions in plant maintenance services shall include the following:

- a) All doors providing access to the plant maintenance space shall be protected by card readers and automatic door locking hardware, with access being restricted at each entrance according to different time-of-day schedules. Consideration shall also be given to card reader access to functional areas within the plant maintenance space, such as employee facilities area (change room) if located close to unrestricted access such as the loading dock, secure storage, etc.
- b) The plant maintenance location access points, as well as each of the main areas within the workspace, should also be supervised by video surveillance cameras. The entrance to the change room shall be secured by a camera located in the hallway monitoring entry and exit to the change room.
- c) Ways of egress shall be clearly indicated low electrical consumption exit signs.
- d) The workspace shall be adequately covered by a centralized fire alarm system, with all necessary components installed and maintained to meet fire alarm standards applicable to public buildings in general and HCFs in particular.
- e) The hot work area, typically located in the general workshop area, should be protected by a panic alarm system.
- f) The general workshop area should contain an eyewash and shower, especially if activities such as key cutting, carpentry, and hot work are being performed.

**10.6 Security and parking****10.6.1 Description****10.6.1.1**

The role of security services is to provide a safe environment for all patients, visitors, and staff. This service is also responsible for protecting HCF property and assets.

**10.6.1.2**

Services generally provided by security and parking services in all facilities can include

- a) access control activities, including locking and unlocking of specific doors and patrolling the properties, building(s), and adjacent site areas; after-hours access control;
- b) reporting hazardous or suspicious conditions;

- c) responding to alarms;
- d) assisting staff in responding to aggressive behaviour;
- e) participating in HCF emergency codes and assisting in searches for missing patients;
- f) providing escorts, as requested, to staff, medical staff, visitors, and patients travelling on the site after dark;
- g) investigating/challenging suspicious persons;
- h) responding, investigating, and reporting on incidents of criminal activity;
- i) assisting with directions and wayfinding;
- j) fire protection and coordinating on-site fire marshals for facilities without a dedicated fire marshal; and
- k) training/in-services for fire drills and emergency codes applicable to security, including the following code situations:
  - i) purple (hostage situation);
  - ii) white (violent situation);
  - iii) yellow (missing patient);
  - iv) green (evacuation); and
  - v) black (bomb threat).

#### **10.6.1.3**

Depending on local conditions, additional services provided by security and parking services can include

- a) escorting of cash and other valuables;
- b) photo identification integrated with access control;
- c) video surveillance;
- d) lost and found;
- e) emergency management;
- f) securing patient valuables;
- g) education (emergency alerts);
- h) locksmithing;
- i) escorting of family and access control to the morgue;
- j) liaising with police and fire services;
- k) capital/maintenance of parking lot/parking service;
- l) valet parking/concierge program;
- m) internal investigation support (for human resources, for example);
- n) providing traffic control and issuing tickets for parking violations;
- o) wandering patient responses;
- p) patient watch program; and
- q) in cases where a help desk is not locally manned 24/7, addressing walk-in help desk requests and liaising with remote help desk operators to report such requests.

#### **10.6.2 Functional requirements**

A review of security risks shall be performed during the planning of the HCF. Proximity of security staff to high-risk areas should be considered in the planning of the HCF.

**Note:** Security incidents can frequently arise in areas such as emergency and mental health treatment/accommodation areas, as well as in proximity to any building entrances that are open at night.

Security should be prominently visible to the public and have convenient access to circulation routes within the HCF.

### **10.6.3 Technical requirements**

#### **10.6.3.1**

HCF entrance areas shall be planned to allow screening and streaming during catastrophic events. Planning should provide for the public display of hand hygiene and masks as well as staff access to PPE.

#### **10.6.3.2**

Staff and public parking areas should be dedicated, with separate entrances and exits such that parking and traffic flow on the site are not impeded.

#### **10.6.3.3**

Consideration should be given to traffic flow during emergency situations.

#### **10.6.3.4**

Service vehicles should be provided with dedicated parking such that patient parking and traffic flow on the site are not impeded.

#### **10.6.3.5**

Electrical receptacles should be supplied in HCF parking areas for

- a) charging of electric vehicles; and
- b) powering of engine block heaters in northern climates.

#### **10.6.3.6**

Dedicated spaces should be provided for arrest holding, separate from patient care and public spaces, to allow holding of persons while waiting for police services.

*Note: Security personnel are often involved in arrests within the HCF.*

#### **10.6.3.7**

Sufficient space should be allocated for preparation of incident reports.

*Note: Security personnel are required to keep extensive documentation.*

#### **10.6.3.8**

Consideration should be given to providing duress/panic stations throughout parking areas.

### **10.6.4 Space details**

Video surveillance equipment requires significant space allocation and should be planned in conjunction with equipment planning. Heat loads of surveillance equipment shall be defined and accommodated in engineering design of HVAC systems serving these spaces.

## **10.7 Medical device reprocessing department**

### **10.7.1 Description**

#### **10.7.1.1 General**

The MDRD is responsible for the decontamination, preparation and packaging, sterilization, and storage of reusable medical devices used in provision of health care. MDRD is an essential service that assists in the prevention of transmission of infections from reusable medical devices used in the HCF.

The MDRD can be of various functional sizes and can be designed as either a centralized system or decentralized system.

**Note:** A centralized system provides service to multiple areas within a HCF or to HCFs located external to the MDRD.

Decentralized systems can be located in areas such as

- a) endoscopy units;
- b) operating rooms; and
- c) diagnostic imaging.

The centralized system for MDRD should be the preferred design model (i.e., decontamination, preparation, packaging, sterilization and sterile storage).

If decentralized reprocessing services are provided outside the MDRD, the principles and standards followed shall be the same as a centralized MDRD.

### **10.7.1.2 General services**

Core services generally provided in MDRD include

- a) receiving contaminated medical devices;
- b) decontamination;
- c) disinfection;
- d) reassembly and functional testing of medical devices;
- e) preparation and packaging;
- f) disinfection/sterilization (often more than one method of sterilization); and
- g) storage of clean and sterilized reusable medical devices.

### **10.7.1.3 Additional services**

Depending on local conditions, some MDRDs can provide additional services such as

- a) restocking of sterile storage areas (e.g., in inpatient units, clinics, critical care, emergency care);
- b) maintaining case cart systems for operating rooms and other treatment locations (e.g., labour and delivery);
- c) reprocessing of respiratory devices;
- d) reprocessing of flexible endoscopes;
- e) performing reprocessing services for other HCFs;
- f) pack assembly and sterilization of surgical drapes and surgeon gowns;
- g) cleaning larger equipment (e.g., pumps, wheelchairs); and
- h) storing and distributing single use medical devices.

## **10.7.2 Functional relationships**

### **10.7.2.1**

Medical device reprocessing shall only take place in dedicated reprocessing areas that comply with the design, construction, and environmental requirements for reprocessing areas, as specified in CAN/CSA-Z314 and CAN/CSA-Z317.2.

**Note:** This requirement applies to every area where reprocessing takes place, including endoscopy and diagnostic imaging/ultrasound.

### 10.7.2.2

The MDRD shall be located near the areas where reusable medical devices are used (e.g., OR), or in locations that allow the safe movement of soiled and clean/sterile materials. Satellite reprocessing facilities, if used, shall be co-located with the procedure room(s) they serve.

**Notes:**

- 1) *This requirement is intended to minimize turnaround time and delays due to transportation and to minimize cross-contamination.*
- 2) *Co-location may either be horizontal or vertical (i.e., through the use of corridors or dedicated elevators).*

### 10.7.2.3

The MDRD design shall facilitate one-way work flow so that contaminated devices always flow one way from the soiled to the clean. The design shall be such that materials do not move in the opposite direction at any point.

**Note:** *Any device that moves against the work flow could introduce contamination to previously uncontaminated devices.*

### 10.7.2.4

The MDRD work flow design shall support the following sequence of activities:

- a) Items enter the MDRD through the decontamination receiving area(s).
- b) Once cleaned and disinfected, the items leave the decontamination area and move to the preparation and packaging area.
- c) From preparation and packaging, the devices either move to sterilization or to a clean storage area.
- d) After sterilization, items move to a sterile storage area where they are dispatched to the user area(s) or are stored until they are needed or their shelf life expires.

### 10.7.2.5

The decontamination receiving area shall be physically separated from the clean area and shall be located at the entrance to the MDRD. Sufficient and adequate space shall be allocated for the receiving area based on expected throughput. Where a decontamination has multiple points of entry (i.e., soiled elevator), one-way work flow shall be maintained to minimize cross contamination. Soiled items are never transported through clean areas.

### 10.7.2.6

If devices need to travel vertically in the HCF, separate dedicated elevators should be provided for soiled and clean device transport. Elevators for receipt of contaminated devices from the OR or other HCF services shall off-load directly into a decontamination receiving area. Elevators for clean device transport shall be located in or near the sterile storage area.

### 10.7.2.7

Sterile storage areas within the MDRD shall be enclosed rooms meeting the requirements of CAN/CSA-Z314. Storage for clean and sterile items outside of the MDRD shall meet the requirements of CAN/CSA-Z314.

### 10.7.2.8

All rooms in which cleaning and disinfection of equipment take place, wherever located in the HCF, shall meet the MDRD design and construction requirements as stated in CAN/CSA-Z314, and the ventilation requirements of CAN/CSA-Z317.2. Such rooms shall be designed to provide one-way work flow, and maintain physical separation between soiled and clean/sterile medical devices.

### 10.7.2.9

Rooms in which soiled items will be held prior to transport shall comply with CSA/CSA-Z317.2, so that appropriate air exchanges and relative pressurization are maintained. Areas for soiled items shall be clearly marked and shall be physically separated from the location of storage areas for clean items and any other storage in the room.

**Note:** If any reprocessing activities will be taking in the storage room (e.g., pre-cleaning), Clause 10.7.2.8 applies.

### 10.7.2.10

The staff locker room should be readily accessible to the MDRD.

**Note:** This can limit the spread of infectious micro-organisms from soiled attire.

## 10.7.3 Space details

### 10.7.3.1 General

#### 10.7.3.1.1

There shall be sufficient space to accommodate the anticipated activities and workload for the MDRD as determined by the following factors:

- a) staffing and service models of the reprocessing services (i.e., centralized including case carts versus decentralized and number of transport carts);
- b) type and number clinical services supported;
- c) volume and type of procedures performed;
- d) the types of medical devices that are sent for reprocessing including inventory levels of both off- and on-side medical devices requiring reprocessing;
- e) degree of mechanization and manual reprocessing within the services;
- f) type, size, and number of reprocessing machines;
- g) location and size of sterile storage areas outside of MDRD (i.e., sterile core); and
- h) size of mechanical rooms for sterilization and disinfection equipment allowing safe maintenance practices.

**Note:** Because space requirements depend on many variables, it is not possible to specify a single set of sizes for the various zones within a reprocessing service. See CAN/CSA-Z314 for detailed space requirements in the MDRD.

#### 10.7.3.1.2

Storage space within sterile storage areas shall be sufficient for the functional program for the MDRD.

**Note:** Facilities that use a case cart system, rigid sterilization container systems and sterilized linen bundles require substantially increased space dependent on the number of line items stored and the frequency of replenishing the sterile storage in MDRD.

#### 10.7.3.1.3

The MDRD shall be designed so that access is unrestricted to MDRD staff and authorized personnel only. All other staff or personnel shall not enter MDRD without requesting access.

### 10.7.3.2 Estimated space requirements and recommendations

Table 10.1 presents requirements for the design and outfitting of key areas within the MDRD. Space requirements for common areas (i.e., those that are not MDRD-specific) are detailed in Clause 11.

Table 10.2 provides general guidance on the space needed for reprocessing areas, based on the number of surgical procedures performed each day.

**Table 10.1**  
**Key space requirements and recommendations — Medical device reprocessing**  
(See Clause 10.7.3.2.)

Item no.	Room names	Net area, m <sup>2</sup>	Requirements and recommendations
1	Decontamination	Varies – See Table 10.2	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Work surfaces used for cleaning and disinfecting shall be nonporous, cleanable with permitted cleaning agents and seamless. See CAN/CSA-Z314.</li> <li>b) The space designated for decontamination shall be equipped with a hand hygiene sink meeting the requirements in Table 11.1.</li> <li>c) Water for decontamination shall be of the appropriate type, quality, and quantity for reprocessing of medical devices, and for the cleaning and disinfecting equipment that it will supply (See AAMI TIR 34).</li> </ul> <p><b>Note:</b> This includes reverse osmosis water at the cleaning stations.</p> <ul style="list-style-type: none"> <li>d) The following building elements and fixtures shall be provided: <ul style="list-style-type: none"> <li>i) double or triple sinks for manual cleaning and disinfecting, with the size and depth to depend on expected tasks and the sizes of the devices to be cleaned;</li> </ul> <p><b>Note:</b> Three sinks should be provided if manual cleaning will take place. Two sinks may be used if they are being used to prepare items for an automated system.</p> <ul style="list-style-type: none"> <li>ii) height adjustable sinks/counters equipped with water pistols, and conveniently located electrical receptacles and data ports;</li> <li>iii) an eyewash station and deluge shower (located in an enclosed space) in accordance with applicable requirements;</li> </ul> </li> </ul>

(Continued)

**Table 10.1 (Continued)**

Item no.	Room names	Net area, m <sup>2</sup>	Requirements and recommendations
			<p><b>Notes:</b></p> <ul style="list-style-type: none"> <li>1) Provincial/Territorial OH&amp;S regulations can apply.</li> <li>2) Showers should be positioned and configured to minimize damage to surrounding areas.</li> <li>iv) tables for sorting, with shelves underneath for storage;</li> <li>v) storage shelves as follows: <ul style="list-style-type: none"> <li>1) shelves for cleaning chemicals in-use (carts may also be used);</li> <li>2) shelves below sinks to store cleaning supplies;</li> <li>3) shelves for PPE storage;</li> </ul> </li> <li>vi) a workstation for instrument tracking and control;</li> <li>vii) a staff washroom that is adjacent or accessible;</li> <li>viii) a staff changing area that is adjacent or accessible;</li> <li>ix) designated space for donning and doffing of PPE at the entrance to and exit from the department; and</li> <li>x) designated space at the entrance to and exit from the department.</li> </ul> <p>e) The following equipment shall be provided that are appropriate to the type and quantity of the devices to be reprocessed, and the processes that will be used:</p> <ul style="list-style-type: none"> <li>i) washer disinfectors, with a dedicated service area and storage provisions for chemicals, instrument baskets, and other accessories;</li> <li>ii) sonic cleaner(s) and rinse/dryers;</li> <li>iii) anaesthetic/respiratory equipment washers (if the selected instrument washers will not reprocess these devices);</li> <li>iv) return conveyor from preparation and pack area;</li> <li>v) pass-through drying cabinets for anaesthetic equipment, if required;</li> <li>vi) multiple washer manifolds, with sufficient space for their carriages; and</li> <li>vii) adequate holding area for carts awaiting cart washer.</li> </ul> <p>f) Decontamination sinks shall be designed and arranged to facilitate soaking, washing, and rinsing of medical devices with minimal movement or delay between these processing steps.</p> <p>g) Sinks should be equipped with water ports for the flushing of instruments with lumens. For additional information, see CAN/CSA-Z314.</p> <p>h) Housekeeping equipment and supplies shall be located in a separate room or closet.</p> <p>i) When planning for equipment, sufficient space shall be provided for <ul style="list-style-type: none"> <li>i) automated loading systems and carriages; and</li> <li>ii) queuing of case carts and other rolling items, pre- and post- reprocessing.</li> </ul> </p> <p>j) Instrument air shall be provided at terminals in decontamination spaces, for drying lumens and other functions.</p>

*(Continued)*

**Table 10.1 (Concluded)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) There should be a separate room for AER reprocessing of endoscopes with a pass through window between it and decontamination. This room will be under negative pressure.</li> <li>b) The MDRD should include a dedicated workstation/space for items requiring low level disinfection (e.g., isolettes, IV poles, etc.) if this service is provided.</li> </ul>
2	Preparation and packaging area	Varies	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) The following building elements and fixtures shall be provided in the preparation and packaging area:           <ul style="list-style-type: none"> <li>i) a pass through window/door from soiled area;</li> <li>ii) space for cart(s) to hold items awaiting assembly, for example:               <ul style="list-style-type: none"> <li>1) instruments;</li> <li>2) sets;</li> <li>3) containers; and</li> <li>4) utensils.</li> </ul> </li> <li>iii) height adjustable work tables with electrical receptacles;</li> <li>iv) task lighting and magnifying lighting;</li> <li>v) space for sterilizer loading carts;</li> <li>vi) pegboards, cabinets and/or drawers for instrument inventory;</li> <li>vii) cabinets for implant plates and screws;</li> <li>viii) racks or shelving for disposable or reusable wrappers;</li> <li>ix) racks for storage of consumables used in preparation and pack area, such as               <ul style="list-style-type: none"> <li>1) sterility assurance indicators; and</li> <li>2) set assembly items (e.g., replacement parts for instrumentation);</li> </ul> </li> <li>x) a workstation for instrument management including electrical receptacles, data drops, monitor, keyboard and printer; and</li> </ul> <p><i>Note: The type and extent of the information and communications elements will depend on whether the MDRD uses or plans to use a computerized medical device tracking system.</i></p> <ul style="list-style-type: none"> <li>xi) a workstation for cleaning verification using compressed air when required.</li> <li>b) The following equipment shall be provided as appropriate to the type and quantity of the devices to be reprocessed, and the processes that will be used:           <ul style="list-style-type: none"> <li>i) return conveyors for washer-disinfectors (if applicable);</li> <li>ii) automated unloading system (if applicable);</li> <li>iii) tube dryer;</li> <li>iv) heat sealer workstation including packaging supplies (e.g., peel pouches);</li> <li>v) light source if using rigid or flexible scopes; and</li> <li>vi) testing equipment for testing electrical medical devices.</li> </ul> </li> </ul> </li></ul>

*(Continued)*

**Table 10.1 (Concluded)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
			<p>c) Sufficient space shall be provided at the cart washer unloading side to marshal carts and to dry them.</p> <p>d) Instrument air shall be provided for drying of devices. The terminal unit for instrument air shall be installed in a dedicated space or sub clean area away from assembly tables.</p> <p>e) Housekeeping equipment and supplies shall be located in a separate room or closet.</p>
3	Sterilization area	Varies	<p><b>Mandatory:</b></p> <p>a) The sterilization area shall be equipped with the following equipment as appropriate to the processes being used:</p> <ul style="list-style-type: none"> <li>i) steam sterilizers, including           <ul style="list-style-type: none"> <li>1) water saver (if applicable);</li> <li>2) dedicated service area;</li> <li>3) dedicated steam line with ability to produce quality steam supply;</li> <li>4) steam filters if used, located in close proximity to the sterilizer's steam supply inlet, to ensure no particles get into the sterilizers through the steam lines;</li> <li>5) steam generator (if applicable); and</li> <li>6) area for access behind the steam sterilizer.</li> </ul> </li> <li>ii) low-temperature sterilizer(s), if needed;</li> <li>iii) workstation for instrument management including electrical receptacles, data drops, monitor, keyboard and printer;</li> <li>iv) workstation for biological indicator sterilization monitoring system(s), including electrical and data drops;</li> <li>v) space for the management of sterilizer carts, before and after processing; and</li> <li>vi) mobile shelving for loading baskets and miscellaneous sterilizer accessories, including test packs.</li> </ul> <p>b) There shall be a dedicated area for cooling of carts coming out of sterilizer – away from direct air flow.</p> <p>c) If the MDRD has an ETO sterilizer, it shall be located in a separate room with dedicated ventilation and continual monitoring for ETO (see CAN/CSA-Z314 and CAN/CSA-Z317.2).</p> <p><b>Advisory:</b> Sterilizers should be located in an enclosed room with the appropriate HVAC design criteria in accordance with CAN/CSA-Z317.2, Table 1, "Sterilizer equipment room."</p>

*(Continued)*

**Table 10.1 (Continued)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
4	Sterile and clean storage area	Varies	<p><b>Mandatory:</b></p> <p>a) The sterile and clean storage area shall be equipped with the following:</p> <ul style="list-style-type: none"> <li>i) shelving and/or automated storage systems;</li> <li>ii) workstation for case cart picking and an instrument management system including electrical receptacles, data drops, monitor, barcode scanner, and keyboard;</li> <li>iii) case carts and collection bins for small items;</li> <li>iv) exchange carts and top-up carts;</li> <li>v) height adjustable work tables;</li> <li>vi) desk at dispatch; and</li> <li>vii) garbage and recycling bins.</li> </ul> <p>b) There shall be a hand hygiene sink or a hand hygiene station at all exits and entrances in compliance with CAN/CSA-Z314.</p> <p><b>Advisory:</b></p> <p>a) If reprocessed endoscopes are to be stored in the sterile and clean storage area, they should be kept in dedicated drying/storage cabinets.</p> <p>b) There should be a means for the posting or displaying of operating room or other relevant activity schedules in sterile and clean storage areas.</p> <p><b>Note:</b> Depending on the HCF's size and configuration, this may be accomplished through the use of wall or ceiling-mounted monitors, a board for schedules, etc.</p>
5	Chemical storage  <b>Note:</b> This may be a designated area or a separate room.	Varies	<p><b>Mandatory:</b></p> <p>a) The chemical storage area shall be equipped with the following:</p> <ul style="list-style-type: none"> <li>i) means for the monitoring of vapours;</li> <li>ii) sink with hose bib;</li> <li>iii) drain or spill catchment system;</li> <li>iv) locking access door;</li> <li>v) chemical-resistant shelving; and</li> <li>vi) dedicated exhaust and appropriate air exchange rates (see CAN/CSA-Z317.2).</li> </ul> <p>b) There shall be ready access to an eyewash station and deluge shower as per applicable requirements.</p> <p><b>Note:</b> Provincial/Territorial OH&amp;S regulations can apply.</p> <p>c) A hand hygiene sink shall be provided.</p> <p><b>Note:</b> A waterless hand hygiene station is not recommended.</p> <p><b>Advisory:</b></p> <p>The detergent dispensing room may be co-located with the chemical storage area, depending on the size of the dispensing system and the amount of detergent stored.</p>
7	Detergent dispensing room  <b>Note:</b> This may be a designated area		<p><b>Mandatory:</b></p> <p>a) The chemicals dispensing system shall be enclosed in its own space and be equipped with the following:</p> <ul style="list-style-type: none"> <li>i) means for the monitoring of vapours;</li> <li>ii) sink with hose bib;</li> </ul>

*(Continued)*

**Table 10.1 (Continued)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
	<i>or a separate room.</i>		<ul style="list-style-type: none"> <li>iii) drain or spill catchment system;</li> <li>iv) locking access door;</li> <li>v) chemical-resistant shelving; and</li> <li>vi) dedicated exhaust and appropriate air exchange rates (See CAN/CSA-Z317.2).</li> </ul> <p><b>Note:</b> <i>Chemicals may be enzyme, lubricants, detergents, etc.</i></p> <p>b) There shall be ready access to an eyewash station and deluge shower as per applicable requirements;</p> <p><b>Note:</b> <i>Provincial/Territorial OH&amp;S regulations can apply.</i></p> <p>c) A hand hygiene sink shall be provided.</p> <p><b>Note:</b> <i>A waterless hand hygiene station should not be used.</i></p> <p>d) The room shall be equipped with an automated detergent dosing/pumping system equipped with alarms, unless the detergent system is integrated with the washer disinfectors.</p> <p><b>Advisory:</b>  <i>The detergent dispensing room may be co-located with the chemical storage area, depending on the size of dispensing system and the amount of detergent stored.</i></p>
6	Hand hygiene sinks	Varies	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) Hand hygiene sinks shall be conveniently located at all entrances to and exits from the decontamination area. See Table 11.1 (19) for specific requirements for hand hygiene sinks.</li> <li>b) For additional information, see CAN/CSA-Z314.</li> </ul> <p><b>Advisory:</b>  <i>If a large room is used for several individuals, more than one sink or station might be necessary. For additional information, see CAN/CSA-Z314.</i></p>
9	Supply receiving and breakout room	Varies	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) A workstation for case cart picking and an instrument management system including electrical receptacles, data drops, monitor, barcode scanner and keyboard as needed shall be provided.</li> <li>b) Height-adjustable work tables shall be provided.</li> <li>c) Garbage and recycling bins shall be provided.</li> <li>d) Storage shelves and drawers for packing and unpacking tools and supplies shall be provided.</li> </ul> <p><b>Note:</b> <i>In a smaller facility this may be a designated area. All breakout rooms should be a separate room for all MDRDs.</i></p>

*(Continued)*

**Table 10.1 (Concluded)**

<b>Item no.</b>	<b>Room names</b>	<b>Net area, m<sup>2</sup></b>	<b>Requirements and recommendations</b>
10	Loaner instrument receiving and shipping space	Varies	<p><b>Mandatory:</b></p> <ul style="list-style-type: none"> <li>a) There shall be a dedicated space or room, with restricted access, for loaner instrument receiving and shipping.</li> <li>b) The space or room shall have <ul style="list-style-type: none"> <li>i) a workstation for case cart picking and instrument management system including electrical receptacles, data drops, a monitor, a barcode scanner, and a keyboard as needed;</li> <li>ii) shelves for materials management supplies; and</li> <li>iii) height-adjustable work tables.</li> </ul> </li> </ul> <p><b>Advisory:</b></p> <ul style="list-style-type: none"> <li>a) If the HCF will be regularly using loaned and shared equipment, there should be a room dedicated to this purpose, with a pass-through window or door.</li> <li>b) This room or area may be shared with the supply receiving and breakout room.</li> </ul>

**Table 10.2**  
**Recommended size of reprocessing areas, net m<sup>2</sup>**  
(See Clause 10.7.3.2.)

Average number of surgical procedures per day	18–24	25–34	35–49	50–74	75–88
<b>Decontamination</b>					
Work area	54	87	104	122	130
Receiving and case cart holding*	9	14	23	33	37
Cart wash area	13	13	20	20	48
Equipment processing area	14	15	16	17	19
Chemical storage	9	9	9	9	9
Housekeeping	4	4	4	4	4
Staff washroom See Table 11.1					
<b>Note:</b> This should be adjacent to staff change rooms or locker rooms.					
Staff change room See Table 11.1.					
PPE room or designated area					
Decontamination total	103	142	176	205	247

(Continued)

**Table 10.2 (Concluded)**

<b>Preparation and packaging including sterilization</b>					
Work area	103	157	204	247	372
Sterilizer service area	32	39	46	50	53
Low temperature sterilizer area†	9	13	18	22	30
Personnel facilities	13	20	28	35	39
Cart holding area post-sterilization cooling		The necessary space depends on the number and type of sterilizers as well as the items being sterilized. The recommended allowance is three spaces per sterilizer. More space could be needed for devices that have a longer cooling time (e.g., orthopedic devices).			
Housekeeping	4	4	4	4	4
Prep and pack total	161	233	300	358	498
<b>Storage and distribution</b>					
Case cart holding	19	28	46	65	74
Sterile storage	139	186	232	279	325
Clean equipment storage	24	37	44	52	56
Reprocessing supply storage	21	21	21	21	21
Dispatch	17	25	34	39	40
Supply receiving and breakout rooms	37	37	46	46	56
Storage and distribution total	257	334	423	502	572
<b>Other</b>					
Conference room	10	15	17	19	20
Loaner Instrument receiving and shipping space		Space should be allocated based on the anticipated number of loaners – both current and future estimates.			
<b>Total area‡</b>	<b>531</b>	<b>724</b>	<b>916</b>	<b>1084</b>	<b>1337</b>

\* Case cart holding area is estimated on the use of 20, 30, 50, 70, and 80 case carts needed to service the average number of surgeries per day. Estimates are also based on 1 m<sup>2</sup> per case cart allowance for case cart movement.

† Excludes ethylene oxide sterilizer area requirements. See CSA Z314 and CAN/CSA-Z314.9 for area requirements for ethylene oxide sterilizers.

‡ Excludes administration areas for MDRD personnel (See Table 11.1 for dimensions of administrative space).

#### Notes:

- 1) Space in sterile storage should consider the number of line items as well as the frequency of delivery.
- 2) Additional space might be required to accommodate larger devices (not just for cooking ortho, but for the larger trays) or to accommodate non-surgical reprocessing requirements.

## 10.7.4 Additional requirements

### 10.7.4.1 Temperature and relative humidity

#### 10.7.4.1.1

Humidity levels in reprocessing areas can be extremely high. Ceiling, walls, and work services in this area shall be impervious to moisture. Load calculations shall be performed to ensure there will be adequate temperature and humidity control in the space, including effective exhaust and air exchange.

#### 10.7.4.1.2

Environmental control in MDRD shall be in accordance with CAN/CSA-Z317.2 and CAN/CSA-Z314, and provision shall be made for daily monitoring of temperature and humidity in all areas in MDRD, and reports kept in MDRD.

**Note:** Work areas should be comfortable for properly attired personnel. Temperatures and humidity levels higher than those recommended can produce an environment conducive to microbial growth and thus increase the overall bioburden.

### 10.7.4.2 Acoustics

#### 10.7.4.2.1

Facilities shall be designed to control noise levels. Equipment (including portable equipment) should be selected, positioned, and installed so that workers are not exposed to excessive or unnecessary noise.

**Note:** Noise levels and protections are mandated by provincial OH&S regulations. Refer to jurisdictional OH&S legislation.

#### 10.7.4.2.2

Building assemblies and finishes shall absorb and reduce noise as much as possible, consistent with infection prevention and control considerations. These building finishes shall be easily cleanable.

#### 10.7.4.2.3

Where noise levels are anticipated to exceed acceptable levels, the HCF shall make provisions for hearing protection.

**Note:** Refer to provincial OH&S safety legislation for the acceptable levels of noise.

#### 10.7.4.2.4

Offices, training, and staff rooms should be located away from noisy areas.

### 10.7.4.3 Lighting

Lighting provisions in the MDRD shall include the following:

- a) Lighting shall be appropriate to the task and age of the work force. The area directly in front of the worker shall be illuminated.
- b) In the decontamination area, additional lights shall be positioned directly above sinks and sorting areas.
- c) In the decontamination and preparation and packaging areas, magnification inspection with lights shall be installed at each workstation.
- d) Light fittings and control in processing and storage areas shall be fully recessed and carefully selected to avoid ledges or crevices where dust can collect.

- e) Lighting shall be appropriate and adaptable for a range of activities performed in the MDRD as determined by a qualified engineer. See CSA Z317.5 for recommended illuminance levels for work environments.

**Notes:**

- 1) *Lighting is essential to the proper performance of decontamination, preparation and packaging, inspection, and processing tasks in the MDRD.*
- 2) *Careful consideration should be given to the colour balance between artificial lighting and natural light. The aim should be to achieve an equal colour balance across all work areas of the services.*

#### 10.7.4.4 Natural light

Natural light should be provided in offices, the staff lounge and the training room whenever possible.

**Note:** *Although desirable in most spaces, it might not be possible to provide natural lighting in all other areas.*

Windows shall be completely sealed and airtight. Window frames, without ledges and joints, shall be used in clean rooms. Where external windows cannot be provided, glazed panels between rooms should be considered. Within restricted spaces, window frames shall be without ledges and joints, and windows shall contain integral blinds. Administrative spaces shall be equipped with window coverings to enable privacy when required.

**Note:** *Dust on lighting fixtures, ledges, or window frames can act as a carrier of micro-organisms.*

#### 10.7.4.5 Privacy

There shall be separate locker areas for staff. Single occupancy washrooms and showers should be gender neutral. Where applicable, washrooms and shower facilities may be located within the locker areas.

#### 10.7.4.6 Infection prevention and control

In addition to the general requirements for infection prevention and control as specified in Clause 7.5, the following provisions shall be made in the MDRD:

- a) All areas used for decontamination, preparation and packaging, assembly and functional testing, sterilization and storage of medical devices shall be designed and built to minimize bioburden and particulate contamination.
  - b) Adequate space shall be provided to carry out reprocessing activities. Functional work areas between decontamination and clean areas shall be separated by walls or partitions to control traffic flow and contain contaminants generated during processing.
  - c) Whenever possible, multi-person contact with high-touch surfaces shall be minimized through the use of automated equipment and related design features built into the MDRD.
- Note:** *Examples of methods to reduce contact include motion-activated waterless hand hygiene stations and motion-activated door openers.*
- d) Building and engineering maintenance/testing can compromise the integrity of the medical device reprocessing environment. Such maintenance and testing shall not be undertaken in the assembly and packaging area at times when devices are being produced or processed. Design considerations that allow easy access to equipment shall minimize the effects of maintenance activities.

**Notes:**

- 1) *Access for maintenance using interstitial spaces or external corridors should be considered.*
  - 2) *Equipment services spaces should be aligned adjacent to building mechanical spaces to allow easy access to maintain and test equipment.*
- e) Test and maintenance equipment, tools, and similar items brought into the MDRD should not pose a risk of contamination or compromise the services environment or the integrity of the items

- processed in it. Where dedicated maintenance equipment is used, a suitable storage area accessible only from the MDRD should be provided.
- f) Consideration should be given for integrating a sound system that has minimal surfaces requiring cleaning, and controllable within the department.

**Note:** *The sound system may be incorporated or connected with the public announcement system.*

#### 10.7.4.7 Materials and finishes

##### 10.7.4.7.1 General

An assessment of the cleaning methods, frequency, and equipment required throughout the services should be made before choosing finishes. All finishes chosen shall be compatible with the required cleaning methods and products. In addition, the following apply to materials and finishes in MDRD:

- a) Finishes shall be suitable for frequent cleaning and tolerant to surface-cleaning agents. Wood and laminate products shall not be used as they allow ingress of water or chemical solutions. Stainless steel is recommended as it is easily cleanable.
- b) Joints should be avoided as they can hold moisture, encouraging the growth of micro-organisms. Worktop sinks and similar items should be built up to walls and any gaps sealed. Where joints are unavoidable, they should be sealed and should allow enough access for cleaning.
- c) To permit flexibility, easy cleaning, and maintenance, whenever possible, workstations and storage units should not be fixed (e.g., use work tables and mobile storage units rather than fixed counters and cupboards).
- d) Ledges trap dust and should be avoided.
- e) Finishes of areas where heavily loaded carts are in use should provide protection (e.g., bumper pads against damage).

##### 10.7.4.7.2 Surface materials

The following requirements apply to surface materials used in MDRD:

- a) Where there is likely to be direct contact with blood or body fluids, floors and walls shall be surfaced with smooth, impermeable seamless materials. In equipment processing areas, work surfaces shall be non-porous, smooth, and easily cleaned.
- b) Work tables shall be constructed of non-porous materials (e.g., stainless steel).
- c) Work surfaces shall be flat, cut resistant, seamless, and composed of a non-porous material so they can be cleaned, disinfected, and dried. Stainless steel surfaces are preferred, given their overall ease of maintenance. Particulate materials that could shed fibres shall not be used.
- d) Laminated materials shall not be used unless they are specified by the manufacturer as providing a chemical-resistant surface suitable for laboratory use. For additional information, see CAN/CSA-Z314.

##### 10.7.4.7.3 Ceilings

The following requirements apply to ceilings in MDRD:

- a) Ceilings shall be resistant to humidity in spaces where steam and moisture are encountered.
- b) Ceilings shall be constructed of non-porous, non-shedding materials with recessed, enclosed pipes and fixtures so as to create a flush surface, facilitating frequent cleaning. Appropriate access shall be provided for maintenance of pipes and fixtures.
- Note:** *The MDRD ceilings should not be composed of porous tiles, particulate, or fibre-shedding materials that can trap and encourage growth of micro-organisms.*
- c) Ceilings shall be constructed without fissures, open joints, or crevices that can retain or permit passage of dirt particles.

#### 10.7.4.7.4 Walls

The following requirements apply to walls in MDRD:

- a) In storage and processing areas in particular, hollow-wall constructions pose an infestation risk and are susceptible to damage from carts. Choice of materials and construction shall eliminate these risks.
- b) Solid walls shall be rendered to a hard smooth finish to facilitate cleaning and repair. Epoxy coating or a sprayed paint finish is appropriate in MDRD areas.
- c) Where hollow walls, partitioning or boxing is used, consideration should be given to means of access and inspection.
- d) Walls shall be protected against damage from wheeled traffic by buffer rails and corner guards, which should be appropriately sited to reflect the specifications of carts in use.
- e) Pipes and other fixtures above work areas shall be enclosed.

#### 10.7.4.7.5 Floors

The following requirements apply to floors in MDRD:

- a) All functional areas of the MDRD areas shall have a uniform floor level. Thresholds between rooms shall be smooth and not elevated. Doorways between adjoining rooms are points of stress and particular attention needs to be paid to the selection and installation of the flooring product.
- b) Floors in decontamination and cart washing areas (as well as load and unload areas) shall be constructed of anti-skid or slip-proof material.
- c) All floors shall be constructed of materials able to withstand wet mopping and the application of cleaning agents.
- d) The finish, the screed (i.e., the layer of cement or other material to level the floor), and sub-floor should be suitable for heavy cart traffic. The flooring shall be turned up at walls using an integral coved molding. This shall be continuous with the floor and finished flush with the wall, so that the junction between the molding and the wall does not provide an entry point for moisture or a ledge where dust can collect. If the flooring has any seams, they shall be welded closed.
- e) Carpet and tile shall not be used.

**Note:** Use of similar floor finishing in different colours integrated into overall flooring can provide a visual demarcation of a dedicated floor space.

#### 10.7.4.7.6 Waste disposal units

Hoppers, if installed, shall be located in the decontamination area away from staff work areas and traffic areas, and be separated by a cleanable physical barrier to contain the spray generated by the unit operation. Caution shall be used in locating a disposal unit in the decontamination area.

#### 10.7.4.7.7 Doors

Automatic and semi-automatic doors shall be provided to facilitate entry and exit of carts into MDRD and throughout the department. Doors shall be fail safe to allow emergency exit in the event of fire or power failure. In addition, the following requirements and recommendations apply to doors in MDRD:

- a) Where door interlocks are provided, the door shall open towards the higher pressure side where possible.  
**Note:** This provision is intended to prevent problems caused by weakening of door closers over time in areas such as decontamination gowning area, prep and pack, etc.
- b) All emergency exits shall have an alarm to indicate they have been opened.
- c) Vision panels (windows) shall be provided in doors that are frequently used. These vision panels shall be easily cleanable.

#### 10.7.4.8 Occupational health and safety

Provisions for occupational health and safety shall include the following:

- a) Functional and storage space shall be provided for chemicals used in the unit.
- b) Functional space shall be provided for storing, donning, and removing protective apparel.
- c) Environmental control for noise and air conditioning shall be provided.
- d) General and task lighting shall be adequate and provided over the work areas.
- e) Space shall be provided for equipment associated with direct-read chemical or biological indicators, if used.
- f) Hand hygiene sinks shall be provided as specified in Table 11.1.
- g) Functional space shall be provided to allow for the movement of carts between tasks.
- h) Automated loading and unloading equipment should be selected.
- i) The floors shall be non-slip.
- j) Depending on the operation model, special ventilation, space and electrical requirements should be provided.
- k) Workstations shall be provided based on the number of staff that will work in that area.  
Workstations shall be adjustable for working height.
- l) Counters, carts, and loading devices should be at the same height, or be of adjustable height, to facilitate horizontal shifting of materials.
- m) Sufficient and accessible space for storing movable equipment and supplies shall be provided by the work zone.
- n) Hands-free door openers should be provided.
- o) Functional and storage space shall be provided for sharps disposal containers.
- p) Eyewash facilities and deluge showers shall be provided when chemicals are being used.
- q) Provision should be made for anti-fatigue mats to be placed at workstations requiring prolonged standing. Anti-fatigue mats, if used, shall be lifted and decontaminated daily.
- r) Ergonomics shall be considered for workstation heights including counters, sinks, etc.

#### 10.7.4.9 Furniture, fittings, and equipment

##### 10.7.4.9.1

Furnishings, fittings, and equipment selection shall be based primarily on the functional workflow and the technical requirements of the service. The size and number of furniture and fittings depend on the volume of devices to be processed in the area.

##### 10.7.4.9.2

In all areas, furniture, shelving, and counters shall be made of materials that are non-porous on all surfaces and non-shedding, easily cleanable, and free of burrs and sharp or rough edges.

##### 10.7.4.9.3

The top and bottom shelves of storage carts shall be solid. In all cases, the selection of materials shall be able to withstand cleaning and disinfection and not absorb water or cleaning solutions.

##### 10.7.4.9.4

If open shelving units are used for storage of sterilized medical devices, the shelves shall be at least 250 mm off the floor, 460 mm from the ceiling, and 50 mm from an outside wall. Automated inventory, storage, and materials handling equipment shall be in accordance with CAN/CSA-Z314.

## 10.7.4.10 Technology considerations

### 10.7.4.10.1 General

Planning for medical device reprocessing services shall include the following requirements and recommendations:

- a) Because traffic into the MDRD is restricted and doors shall always be closed, a communication system from the outside to the inside of the services shall be provided.
- b) A buzzer/intercom type of system shall be located at the soiled receiving area, sterile supply dispatch point, and the reception area of the MDRD.
- c) Main door(s) into the MDRD, and within it, shall be hands free to allow the unrestricted movement of large wheeled carts, etc., in or out of the areas.
- d) There shall be a system to allow communication of essential information from managers to staff. The system should be able to monitor and record when staff receive and open essential messages. Planning should take into consideration the means by which staff will access their messages.
- e) A hands-free method for communication between decontamination and the clean side of the services shall be provided.
- f) Consideration should be given to a VSS. Planning such a system should include provision for mountings, cameras, and cabling.

**Note:** *Video surveillance in the clean and soiled case cart holding areas in the OR suite can alert MDR staff to the need for pickup or delivery without direct voice communication from the area.*

- g) The use of scheduling and monitoring systems should be considered in the OR, and TV monitors in key places within MDRD. These systems help with communication between departments and alerts MDRD as to when OR procedures are completed.
- h) Consideration should be given to include an electrical receptacle for BI incubators.
- i) The number and location of electrical receptacles and data connections shall be determined based on the equipment to be used in the area.

**Notes:**

- 1) *Various types of technology are available to improve the efficiency of medical device reprocessing in MDR. They fall into two broad categories:*
  - a) *automated reprocessing equipment; and*
  - b) *instrument management systems.*
- 2) *Communication methods can take the form of portable phones, hand-held devices, intercoms, and/or annunciator-type video screens. Required space and services/infrastructure depend on the technology that is selected.*
- 3) *The following locations generally require electrical receptacles and data connections:*
  - a) *decontamination area — in the receiving zone and elsewhere as needed;*
  - b) *all workstations in the prep and pack area;*
  - c) *sterilization loading area;*
  - d) *sterile storage area;*
  - e) *dispatch area; and*
  - f) *administration area.*

### 10.7.4.10.2 Water and steam quality

Planning for the MDRD shall include measures to ensure that water quality and (where applicable) steam quality will be appropriate for use in reprocessing, cleaning and disinfection equipment, and steam sterilizers. Sampling ports shall be provided in the water and steam systems to facilitate testing of water quality and steam quality, and sampling of steam condensate.

**Notes:**

- 1) *CAN/CSA-Z314 and AAMI TIR 34 provide additional information and guidance on steam and water quality.*

- 2) Sampling ports for steam quality should be located at the boiler and at a point close to sterilization equipment.
- 3) Sampling ports for equipment water should be at or near the supply connection for the equipment.

If steam sterilizers will draw on the HCF steam system, the MDRD planning process shall specify the quality and quantity of steam required for the sterilizers, and the ability of the system to provide this steam shall be confirmed.

**Note:** See the steam quality requirements in CAN/CSA-Z314.

#### 10.7.4.10.3 Automated reprocessing equipment

Whenever possible, automated reprocessing equipment rather than manual methods shall be used for medical device reprocessing.

**Note:** Automated processes provide standardized outcomes and protect workers from occupational hazards, such as exposure to contaminated aerosols during decontamination.

Planning of technology systems for automated reprocessing equipment shall include the following requirements and recommendations:

- a) Space planning for the decontamination, preparation, and packaging and sterilization areas shall take into account the size of the equipment to be used in those areas. The service space for the equipment shall also be considered.
- b) In large facilities, automated systems for loading and unloading of the reprocessing equipment should be considered.  
**Note:** Automated loading systems can improve through-put/efficiency and reduce musculoskeletal injury risk for staff.
- c) All loading systems and mechanisms shall be easily serviceable and cleanable.

#### 10.7.4.10.4 Instrument management system

Where an instrument management system is present, the MDRD design should include the necessary space and electronic infrastructure to support the instrument management system that will be used in the HCF.

**Note:** An instrument management system allows the HCF to track the location of all devices in the system. They can link those devices to specific patients, which is an important requirement for patient safety and quality assurance. They allow standard operating procedures to be immediately available to reprocessing staff. They provide a permanent record that verifies that critical reprocessing parameters (e.g., sterilization) were achieved, which is another essential aspect of quality assurance. They can also provide important data and reports that help managers to make better-informed decisions. Inventory management systems track the consumption of single-use products as they are used and/or returned, and generate replacement orders.

Design and construction requirements for instrument and inventory management systems depend on the system that is chosen. Provision shall be made for the following features, as appropriate to the requirements of the system:

- a) routine data input methods:
  - i) scanner (e.g., bar code or laser etching);
  - ii) sensor [e.g., radio frequency identification (RFID)]; and
  - iii) keyboard/mouse/touch screen;
- b) routine data output methods:
  - i) monitor/screen;
  - ii) page printer; and
  - iii) label printer; and

- c) ongoing data uploading and updating:
  - i) monitor/screen;
  - ii) keyboard/mouse; and
  - iii) central server

#### **10.7.4.11 Environmental monitoring for ethylene oxide**

##### **10.7.4.11.1**

When ethylene oxide (ETO) sterilization is used, the area shall be monitored for ETO to ensure the safety of HCF staff, patients, visitors, and the public.

**Notes:**

- 1) See Environment Canada guidelines and provincial/territorial occupational health and safety regulations.
- 2) See CAN/CSA-Z314 for additional information.

##### **10.7.4.11.2**

For internal monitoring of the MDRD, the HCF shall have

- a) a gas chromatograph monitor; and
- b) sensors located as specified in Clause 10.7.4.11.7.

##### **10.7.4.11.3**

For external monitoring, the HCF shall have an exhaust sensor for the abator or catalytic convertor.

##### **10.7.4.11.4**

The following alarm systems shall be installed:

- a) local exhaust ventilation system failure;
- b) ETO detection;
- c) fire; and
- d) smoke.

All alarm systems shall have both audible (e.g., horn, klaxon) and visible (e.g., flashing coloured light) signals. All alarm systems shall be connected to the emergency power system.

##### **10.7.4.11.5**

Alarm sensors that indicate inadequate negative duct pressure shall be either pressure differential sensors, sail switches, or another type of sensor selected by a competent system designer. They shall be located at the following points:

- a) in the exhaust hood over the container storage area; and
- b) in the gas scavenging system over each sterilizer.

**Note:** The sterilizer manufacturer might include an ETO scavenging sensor with the sterilization equipment.

##### **10.7.4.11.6**

The ETO alarm system shall be capable of alerting the operator when excessive ETO is present in the ethylene oxide sterilization area. This alarm system is not intended to measure ETO worker-exposure levels.

##### **10.7.4.11.7**

Sensors for the ETO alarm system shall be placed in the following locations:

- a) above the sterilizer gas scavenging system;

- b) above the container storage exhaust hood;
- c) in the centre of the service room;
- d) in the centre of the ETO sterilization area;
- e) in other areas where the ETO concentration is likely to be high;
- f) these sensor positions allow the system to detect the presence of ETO in the workers' breathing zone; and
- g) the alarm system's designer, in consultation with occupational health and safety, risk management, and supervisory staff, should determine the exact placement of the sensors.

#### 10.7.4.11.8

Fire alarms shall be placed in the ETO sterilization area in accordance with the applicable fire code. Alarms from the sterilizer area shall be connected to the building management system, if applicable. If any part of the sterilization equipment is located in an area that is separate from the ETO sterilization area (e.g., the containers are not stored with the rest of the sterilization equipment), the separate area shall also have fire alarms as required by the fire code.

#### 10.7.4.11.9

Alarm systems shall be installed, maintained, and regularly tested in accordance with applicable requirements and the facility's risk management policy.

#### 10.7.4.11.10

Handling, storage, and disposal of cylinders and cartridges shall be in accordance with

- a) manufacturer's recommendations;
- b) CAN/CSA-Z314; and
- c) applicable requirements.

*Note: In Canada, applicable jurisdictional requirements are covered by provincial/territorial and local fire codes and occupational health and safety guidelines. These also govern the use of the WHMIS.*

#### 10.7.4.12 Safety and security

The MDRD shall

- a) restrict access to the MDRD within the HCF;
- b) provide an access control system (e.g., card readers to all perimeter doors);
- c) enable direct observation of all persons entering the MDRD; and
- d) provide alarm systems and or staff emergency assistance alarms for staff security.

### 11 Table of common requirements

The following list and Table 11.1 define the requirements for common areas, if these areas are required by the functional program of the HCF (the numbers below correspond to their numbering in Table 11.1):

1. Assessment room — General;
2. Breastfeeding room;
3. Central staff station (nurse station);
4. Change/locker room;
5. Charting alcove;
6. Chart storage;
7. Classroom/meeting room/educational facilities;
8. Clean supply/utility room;

9. Decentralized equipment storage;
10. Departmental resource library;
11. Diagnostic viewing workstation;
12. Dictation/review workstation;
13. dining room;
- 14a. Examination room;
- 14b Procedure/treatment room
- 14c Examination/procedure/treatment room – Bariatric
15. Examination/procedure/treatment room — Isolation;
16. Examination/procedure/treatment room — Adjacent washroom;
17. Examination— Safe room;
18. Gym;
19. Hand hygiene sink;
20. Waterless hand hygiene station;
21. Housekeeping closet;
22. Housekeeping service room;
23. Hydrotherapy room;
- 24a Inpatient bedroom;
- 24b Inpatient bedroom – Bariatric;
- 25a. Inpatient washroom;
- 25b Inpatient washroom – Bariatric;
26. Airborne isolation room suite;
27. Imaging/equipment alcove;
28. Laundry (patient use);
29. Lounge, patient/visitor — General;
30. Lounge, patient (pediatric or adolescents);
31. Medication room;
32. Nourishment centre;
33. Offices (staff);
34. Outdoor space;
35. Play area (pediatric or adolescents);
36. Reception/control desk;
37. Respiratory therapy/anaesthesia support area;
38. Satellite pharmacy;
39. Soiled utility/holding room;
40. Small multi-disciplinary assessment/treatment room;
41. Large multi-disciplinary assessment/treatment room;
42. Staff coat room;
43. Staff room;
44. Storage room;
45. Sub-sterile supply/case cart holding area;
46. Tub/shower room;
47. Waiting area/rooms;
48. Washroom (public); and
49. Work area (staff/student).