

IPC Post Disaster Recommissioning of Healthcare Facilities

This document was developed by Alberta Health Services (AHS) Infection Prevention and Control (IPC) for use by experienced Infection Control Professionals (ICPs). It includes information about post disaster management and includes a checklist of key elements/criteria to consider during hospital recommissioning. IPC requirements are integral to recommissioning healthcare facilities post disaster (flood, fire, etc.). Additionally, IPC must be engaged in the commissioning of temporary health service delivery areas and structures used during the disaster and the post-disaster periods. The *Post Disaster Infection Prevention and Control Checklist by Area*, located on page six, focuses on Acute Care Hospitals, but the checklist criteria may also be used for recommissioning of other healthcare facilities.

Overview

Health services are an integral component of every community. In the event of a disaster (man-made or natural) availability of, and accessibility to health services becomes increasingly important to support first responders and/or those who have been impacted by the disaster.

The AHS Incident Management System (IMS) organizational structure is based on the Incident Command System (ICS), which enables rapid integration and connectivity between sites, services, zones, external partners and stakeholders. It defines the roles and responsibilities of personnel and the operating procedures to be used in the management and direction of emergencies and disasters.

As experts in infection risk assessments, Infection Control Professionals (ICPs) assist with:

- decisions regarding retaining/disposing or reprocessing of clean/sterile supplies, pharmaceuticals or food items in patient care areas
- planning for adequate waste/medical waste management
- assessment of the space for temporary relocation of departments
- all remediation/construction/renovation activities including design, preventive measures, inspections and post construction sign-off prior to occupancy

Health service reactivation considerations

Prior to health service reactivation, adequate support services need to be available to provide quality care in a safe environment.

Some departments may continue to safely function in a different location within the facility or off-site until their regular department space is recommissioned. Contracting with outside services may also be considered.

Heating Ventilation Air Conditioning (HVAC) system cleaning and health service reactivation sequencing will be prioritized depending on the level of remediation required, availability of potable water, air handling unit (AHU) functionality, and the departments each AHU serves. As part of the ICS, IPC may assist in determining the sequence of health service reactivation.

The following is an example of sequencing:

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- **Phase one (a):** Off site: Establish an urgent care centre and/or field hospital to support first responders.
- **Phase one (b):** Affected Hospital: Facilities Maintenance and Engineering (FME), Contracting Procurement and Supply Management (CPSM), Clinical Engineering, Medical Device Reprocessing(MDR), Environmental Services, Emergency/Trauma, Pharmacy, Laboratory, Diagnostic Imaging and Respiratory.
- **Phase two: Laundry, Kitchen, Medicine, Operating Theatres and Surgical Units.**
- **Phase three: In-patient Psychiatry, Oncology, Radiology, Dialysis, etc.**

Note: Additional building infrastructure improvement projects may be undertaken while the facility is vacant of staff and patients. For example: department upgrade projects, flooring projects, IT infrastructure cabling, etc. All construction/renovation projects must meet minimum design guidelines. The ICP is involved in these projects by: assessing risk, determining appropriate preventative measures, participating in inspections and signing off upon completion.

General information for Infection Control Professionals (ICPs)

Once the decision is made to proceed with recovery and remediation, building and life safety inspections will be completed before any restoration work is initiated. Companies with expertise in remediation may be contracted to complete this work.

Safety evaluation

Before access is granted to the building, experts will complete a safety evaluation, including assessment of:

- structural integrity
- hidden moisture
- electrical system damage, including high voltage, insulation, and power integrity
- water distribution system damage, loss of water situation: refer to [How to Use Water Safely in Acute Health Care Sites during a Boil Water Advisory](#)
- sewer system damage
- fire emergency systems damage
- air handling system damage
- biomedical waste and sharps disposal system
- hazardous chemicals and materials/radioactive storage and removal
- hazardous infectious materials in laboratory

Facility infrastructure and remediation considerations

Consider the following points; these are not in a specific order and may occur concurrently:

- Inspect, clean and disinfect, repair and/or replace HVAC system (motors, duct work, filters, insulation, chillers, and duct humidifiers). Consult experts for recommissioning of HVAC and other system components as needed.

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- Treat, flush and test potable water systems (potable water supply, potable water distribution systems, and distilled, demineralized, steam and condensate).
- Treat and test steam sources (e.g. medical device reprocessing steam source).
- Inspect, repair and/or replace electrical system (wiring, lighting, paging and patient call systems, emergency generators, fire alarms, etc.).
- Inspect, repair and/or replace electronic communication systems (telephones, paging and patient call systems, computers, etc.).
- Inspect, repair and/or replace medical gas system.
- Inspect, repair and/or replace the OR Plume Scavenging System (PSS) (e.g., clean lines, verify position of intake, verify flow settings, filter replacement, and confirm that the PSS is performing to the manufacturer's specifications).
- Inspect and assess biological safety cabinets. Power failures may result in puff back through the HEPA filters into the cabinet openings/room, don PPE (N95), clean and disinfect.

Water removal, damage assessment and remediation considerations

For water damage, consider the following remediation requirements:

- Remove water as soon as possible after the safety of the structure has been verified:
 - pump out standing water
 - wet vacuum residual wetness from floors, carpets and hard surfaces. Note: Clean wet vacuums after use and allow to dry.
- Initiate preventative measures based on **Infection Control Risk Assessment** (Insite> Home >Teams >Infection Prevention & Control >Facility Design IPC Guidelines). Determine if structural materials and equipment will be dry within 48 hours (moisture detection devices should be used).
- Before dehumidifiers are activated, move salvageable supplies and equipment out of the area. Consider hoarding if area cannot be contained.
- Remove porous items that remain wet after 48 hours and/or have visible mold growth or damage.
 - Wrap contaminated material with clean plastic sheeting or seal in an enclosed container for disposal as construction waste to minimize dispersion of mold spores.
- Clean and disinfect hard surfaces, equipment, and other cleanable, non-porous materials prior to removal from the impacted space.

General inventory of damaged areas and materials

Furniture

- Discard all porous furniture and materials that cannot be dried within 48 hours. Dispose of particle board furniture.
- Follow incident command post guidance for assessment/cleaning/disposal of porous furniture in the case of fire/smoke damage.
- Clean and disinfect furniture with non-porous surfaces using AHS provided products.

Supplies

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- Consider event-related sterility when assessing supplies for disposal.
- Discard items if the integrity has been compromised due to exposure to extremes in temperature, humidity, water, or mold.
- An inventory list of discarded supplies may be required for insurance.
- Salvage undamaged, prepackaged supplies.
- Launder salvaged linens and curtains.
- Dry essential paper files and records. If contaminated, contact Health Information Management (HIM) and professional conservators if needed.

Electrical medical equipment

- Check motors, wiring, fans and insulation for damage.
- Inspect equipment for moisture damage.
- Clean and disinfect equipment following manufacturers' instructions.
- Consult Biomed to perform regular preventative maintenance prior to reuse.

Structures

- Inspect, repair, or replace wallboard, ceiling tiles, and flooring.
- Repair, replace, and clean damaged structures.

Necessary IPC requirements for opening a facility

- Potable water
- Adequate sewage disposal
- Adequate general waste and biomedical waste management
- All areas have been thoroughly dried, repaired and cleaned
- HVAC system fully functioning according to recommended standards including airborne isolation rooms
- HEPA filters have been validated or replaced

Post reoccupation surveillance

- Consider surveillance for patients who occupy spaces affected by the disaster for acquisition of healthcare-acquired infections.

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Post Disaster Infection Prevention and Control Checklist by Area

This is a working document, intended to be revisited throughout the remediation process as work progresses.

Print off section #1 for each Patient Care Areas/Unit (including Emergency) that is being reviewed.

Patient Care Area reviewed _____

No	Area	Yes	No	Notes
1.0	All Patient Care Areas/Units Including Emergency Instructions: **Print one copy of section 1.0 for every patient care unit including Emergency**			
1.1	Furniture including beds/stretchers are inspected, repaired, cleaned and disinfected, or disposed of, depending upon extent of damage and ability to clean	<input type="checkbox"/>	<input type="checkbox"/>	
1.2	Linens are laundered	<input type="checkbox"/>	<input type="checkbox"/>	
1.3	Damaged or contaminated medications, solutions and supplies are discarded	<input type="checkbox"/>	<input type="checkbox"/>	
1.4	Stored food (dry and canned goods) is inspected for damage and contamination; and discarded if it is unsafe to consume	<input type="checkbox"/>	<input type="checkbox"/>	
1.5	Ice machines are flushed, cleaned and disinfected according to manufacturer's instructions for use	<input type="checkbox"/>	<input type="checkbox"/>	
1.6	Perishable food is discarded and refrigerators are cleaned and sanitized	<input type="checkbox"/>	<input type="checkbox"/>	
1.7	Medical gas and suction systems, including air lines, are clean and operable	<input type="checkbox"/>	<input type="checkbox"/>	
1.8	Affected equipment is inspected by Clinical Engineering, and maintenance performed as per area-specific Standards, SOPs, and manufacturer's instructions for use	<input type="checkbox"/>	<input type="checkbox"/>	
1.9	Reusable equipment is cleaned and disinfected/sterilized according to manufacturer's instructions for use	<input type="checkbox"/>	<input type="checkbox"/>	

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No	Area	Yes	No	Notes
2.0	Contracting, Procurement and Supply Management (CPSM)			
2.1	Shipping and receiving area is cleaned	<input type="checkbox"/>	<input type="checkbox"/>	
2.2	If the loading dock area is used for removal of waste for the building, a different area is identified and used for receiving clean and sterile supplies	<input type="checkbox"/>	<input type="checkbox"/>	
3.0	Environmental Services			
3.1	All Environmental Services areas/closets are cleaned and disinfected	<input type="checkbox"/>	<input type="checkbox"/>	
3.2	Assess the integrity of supplies and solutions for exposure to extreme temperatures, humidity, water or mold	<input type="checkbox"/>	<input type="checkbox"/>	
3.3	Compromised supplies are discarded	<input type="checkbox"/>	<input type="checkbox"/>	
3.4	Equipment is cleaned and disinfected	<input type="checkbox"/>	<input type="checkbox"/>	
4.0	Laboratory Services			
4.1	Lab conducts risk assessments to determine if reagents and other supplies can be used Lab conducts assessment of infectious materials, manages disposal and documentation Lab assesses level of biosecurity			
4.1	Damaged or contaminated reagents and supplies are discarded	<input type="checkbox"/>	<input type="checkbox"/>	
4.2	Biological safety cabinet(s) are clean and disinfected (N95 respirator, gloves, and gown are worn if HEPA filter has been affected)	<input type="checkbox"/>	<input type="checkbox"/>	
4.3	Biological safety cabinet(s) are recertified	<input type="checkbox"/>	<input type="checkbox"/>	
4.4	Equipment is cleaned and disinfected	<input type="checkbox"/>	<input type="checkbox"/>	

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No	Area	Yes	No	Notes
5.0	Diagnostic imaging			
5.1	Damaged or contaminated medications, solutions, media and supplies are discarded	<input type="checkbox"/>	<input type="checkbox"/>	
5.2	Medical devices and equipment are inspected for damage; and manufacturers contacted for guidance on repair, cleaning and disinfection as necessary	<input type="checkbox"/>	<input type="checkbox"/>	
6.0	Medical Device Reprocessing areas			
6.1	Damaged or contaminated disinfectants, and quality control supplies are discarded	<input type="checkbox"/>	<input type="checkbox"/>	
6.2	Medical device reprocessing equipment is inspected for damage; and manufacturers contacted for guidance on repair, cleaning, disinfection and commissioning as necessary	<input type="checkbox"/>	<input type="checkbox"/>	
6.3	Affected equipment is validated and/or certified as per area-specific standards, Standard Operating Procedures (SOPs), and manufacturer's instructions for use (e.g., sterilizers, endoscope reprocessing equipment and storage cabinets)	<input type="checkbox"/>	<input type="checkbox"/>	
6.4	Sterile supplies are inspected and if found to be compromised are reprocessed or replaced	<input type="checkbox"/>	<input type="checkbox"/>	