

Non-hospital Medical and Surgical
Facilities Accreditation Program

ACCREDITATION STANDARDS

Heating, Ventilation and
Air Conditioning (HVAC)

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Non-hospital Medical and Surgical Facilities Accreditation Program
College of Physicians and Surgeons of British Columbia
300-669 Howe Street
Vancouver BC V6C 0B4

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Introduction

Heating, ventilation and air conditioning systems support several vital functions in health-care facilities including infection prevention and control and life safety. Proper air quality, air volume changes and air flow direction are all key to reducing infection and protecting the health and safety of patients, staff and visitors. Air changes alone are not enough to dilute the concentration of airborne microorganisms. The HVAC system should also be designed based on the “defend in place” concept (i.e. patients may not be able to self-preserve) wherein the system provides early warning, suppression and containment of fire and smoke.

Heating, ventilation and air conditioning

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.0	HEATING, VENTILATION AND AIR CONDITIONING				
HVAC1.1	HVAC system maintains the appropriate temperature, humidity and ventilation parameters in the operating room(s).				
HVAC1.1.1	<p>M There is local readout of room temperature in each operating room.</p> <p>Guidance: There is a local readout device in each operating room.</p>		M		P, F
HVAC1.1.2	<p>M The HVAC system provides appropriate temperature control in the operating room(s).</p> <p>Guidance: See CSA Z317.2 Table 1: Operating rooms 18-23°C. Local readout is in accordance with the appropriate parameters. Local heating or cooling units are not used (e.g. window air conditioners, fan coils, induction units, space heaters, perimeter baseboard heaters).</p>		M		P, F
HVAC1.1.3	<p>M There is local readout of relative humidity in each operating room.</p> <p>Guidance: There is a local readout device in each operating room.</p>		M		P, F
HVAC1.1.4	<p>M The HVAC system provides appropriate relative humidity control in the operating room(s).</p> <p>Guidance: See CSA Z317.2 Table 1: Operating room 30-60%. Local readout is in accordance with the appropriate parameters. Low humidity may cause drying of mucous membranes and hypothermia of patients during lengthy procedures. Lower humidity can increase the number of dust particles that may carry bacteria and may also support the accumulation of static electricity.</p>		M		P, F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.1.5	<p>M The HVAC system provides appropriate relative pressurization control in the operating room(s).</p> <p>Guidance: Operating room relative pressurization is at minimum +2.5 Pa. Local readout in the operating room, if required, is within the appropriate parameters.</p>		M		P, F
HVAC1.1.6	<p>M Equipment and supplies do not obstruct the return ducts.</p> <p>Guidance: Back tables and equipment within the room are not placed in front of or in a position to obstruct the return ducts.</p>		M		P, F
HVAC1.2	HVAC system maintains the appropriate temperature, humidity and ventilation parameters in the procedure room(s).				
HVAC1.2.1	<p>M There is local readout of room temperature in each procedure room.</p> <p>Guidance: There is a local readout device in each procedure room.</p>		M		P, F
HVAC1.2.2	<p>M The HVAC system provides appropriate temperature control in the procedure room(s).</p> <p>Guidance: See CSA Z317.2 Table 1: Procedure room 18-22°C. Local readout is in accordance with the appropriate parameters. Local heating or cooling units are not used (e.g. window air conditioners, fan coils, induction units, space heaters, perimeter baseboard heaters).</p>		M		P, F
HVAC1.2.3	<p>M There is local readout of relative humidity in each procedure room.</p> <p>Guidance: There is a local readout device in each procedure room.</p>		M		P, F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.2.4	<p>M The HVAC system provides appropriate relative humidity control in the procedure room(s).</p> <p>Guidance: See CSA Z317.2 Table 1: Procedure room 30-60%. Local readout is in accordance with the appropriate parameters.</p>		M		P, F
HVAC1.2.5	<p>M There is local readout of relative pressurization in each procedure room.</p> <p>Guidance: There is a local readout device in each procedure room in facilities built 2011 and onwards. Facilities built prior to 2011 are not required to have local readout of relative pressurization.</p>		M		P, F
HVAC1.2.6	<p>M The HVAC system provides appropriate relative pressurization control in the procedure room(s).</p> <p>Guidance: Procedure room relative pressurization is at minimum +2.5 Pa. Colonoscopy procedure rooms built prior to 2015 can be negative pressure. If at negative pressure, the colonoscopy procedure room relative pressurization is at minimum -2.5 Pa. Local readout in the procedure room, if required, is within the appropriate parameters.</p>		M		P, F
HVAC1.2.7	<p>M Equipment and supplies do not obstruct the return ducts.</p> <p>Guidance: Back tables and equipment within the room are not placed in front of or in a position to obstruct the return ducts.</p>		M		P, F
HVAC1.3	HVAC system maintains the appropriate temperature, humidity and ventilation parameters in the MDR decontamination room.				
HVAC1.3.1	<p>M There is local readout of room temperature in the MDR decontamination room.</p> <p>Guidance: There is a local readout device in the MDR decontamination room.</p>		M		P, F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.3.2	<p>M The HVAC system provides appropriate temperature control in the MDR decontamination room.</p> <p>Guidance: See CSA Z317.2 Table 1: MDR Decontamination room 18-20°C. Local readout is in accordance with the appropriate parameters. Local heating or cooling units are not used (e.g. window air conditioners, fan coils, induction units, space heaters, perimeter baseboard heaters).</p>		M		P, F
HVAC1.3.3	<p>M There is local readout of relative humidity in the MDR decontamination room.</p> <p>Guidance: There is a local readout device in the MDR decontamination room.</p>		M		P, F
HVAC1.3.4	<p>M The HVAC system provides appropriate relative humidity control in the MDR decontamination room.</p> <p>Guidance: See CSA Z317.2 Table 1: MDR Decontamination room 30-60%. Local readout is in accordance with the appropriate parameters.</p>		M		P, F
HVAC1.4	HVAC system maintains the appropriate temperature, humidity and ventilation parameters in the MDR clean room.				
HVAC1.4.1	<p>M There is local readout of room temperature in the MDR clean room.</p> <p>Guidance: There is a local readout device in the MDR clean room.</p>		M		P, F
HVAC1.4.2	<p>M The HVAC system provides appropriate temperature control in the MDR clean room.</p> <p>Guidance: See CSA Z317.2 Table 1: MDR Clean room 18-23oC. Local readout is in accordance with the appropriate parameters. Local heating or cooling units are not used (e.g. window air conditioners, fan coils, induction units, space heaters, perimeter baseboard heaters).</p>		M		P, F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.4.3	M There is local readout of relative humidity in the MDR clean room. Guidance: There is a local readout device in the MDR clean room.		M		P, F
HVAC1.4.4	M The HVAC system provides appropriate relative humidity control in the MDR clean room. Guidance: See CSA Z317.2 Table 1: MDR Clean room 30-60%. Local readout is in accordance with the appropriate parameters.		H		P, F
HVAC1.5	HVAC system maintains the appropriate temperature, humidity and ventilation parameters in the sterile storage area.				
HVAC1.5.1	M There is local readout of room temperature in the sterile storage area. Guidance: There is a local readout device in the sterile storage area.		M		P, F
HVAC1.5.2	M The HVAC system provides appropriate temperature control in the sterile storage area. Guidance: See CSA Z317.2 Table 1: Sterile Storage 20-23°C. Local readout is in accordance with the appropriate parameters. Local heating or cooling units are not used (e.g. window air conditioners, fan coils, induction units, space heaters, perimeter baseboard heaters).		M		P, F
HVAC1.5.3	M There is local readout of relative humidity in the sterile storage area. Guidance: There is a local readout device the sterile storage area.		M		P, F
HVAC1.5.4	M The HVAC system provides appropriate relative humidity control in the sterile storage area. Guidance: See CSA Z317.2 Table 1: Sterile Storage 30-60%. Local readout is in accordance with the appropriate parameters.		M		P, F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.6	<p>The HVAC system is maintained in accordance with CSA Z317.2. Intent: The HVAC system is operated and maintained through a coordinated and well-documented program.</p>				
HVAC1.6.1	<p>M The HVAC system provides appropriate relative pressurization.</p> <p>Guidance: Regular monitoring and calibration of the HVAC system is essential to verify that the system is operating as intended and continues to do so over time. See CSA Z317.2 Table 1: These are minimum requirements and do not preclude the use of higher pressurization differentials. Operating rooms +2.5Pa; Procedure room +2.5Pa; PACU + or neutral; MDR Decontamination room -2.5Pa, MDR Clean room +2.5Pa; Sterile Storage +2.5Pa. Colonoscopy procedure rooms built prior to 2015 can be negative pressure. If at negative pressure, the colonoscopy procedure room relative pressurization is at minimum -2.5 Pa. Annual balancing and directional airflow reports are on file. In facilities built 2011 and onwards, the annual balancing and directional airflow reports must confirm the minimum or higher relative pressurization in pascals (Pa) in the following areas: operating rooms, procedure rooms, PACU, MDR decontamination room, MDR clean room and sterile storage. In facilities built prior to 2011, the annual balancing and directional airflow reports should confirm the appropriate relative pressurization (positive, negative or equal) in the following areas: operating rooms, procedure rooms, PACU, MDR decontamination room, MDR clean room and sterile storage; however facilities built prior to 2011 will not be denied accreditation on the basis of non-conformance with the CSA HVAC standards.</p>		L		P, F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.6.2	<p>M The HVAC system provides appropriate air exchanges.</p> <p>Guidance: Regular monitoring and calibration of the HVAC system is essential to verify that the system is operating as intended and continues to do so over time. See CSA Z317.2 Table 1. These are minimum requirements and do not preclude the use of higher rates. Outdoor air changes per hour/total air changes per hour. Operating rooms 6/20; Procedure rooms 5/15; PACU 6/20; MDR Decontamination room 3/10; MDR Clean room 3/10; Sterile Storage -/4. Annual balancing and directional airflow reports are on file. In facilities built 2011 and onwards the annual balancing and directional airflow reports must confirm the minimum required outdoor and total air changes per hour in the following areas: operating rooms, procedure rooms, PACU, MDR decontamination room, MDR clean room and sterile storage. In facilities built prior to 2011, the annual balancing and directional airflow reports should confirm the appropriate outdoor and total air changes per hour in the following areas: operating rooms, procedure rooms, PACU, MDR decontamination room, MDR clean room and sterile storage; however facilities built prior to 2011 will not be denied accreditation on the basis of non-conformance with the CSA HVAC standards.</p>		L		P, F
HVAC1.6.3	<p>M Local heating units, cooling units and dehumidifiers are not used.</p> <p>Guidance: Local heating units, cooling units and dehumidifiers such as window air conditioners, fan coils, induction units, space heaters, perimeter baseboard heaters are not located in the operating room(s), procedure room(s), post-anesthesia care unit, medical device reprocessing areas and sterile storage.</p>		L		P, F
HVAC1.6.4	<p>M Primary filters have a minimum MERV rating of 8.</p> <p>Guidance: This is the minimum MERV rating for filters serving operating rooms, procedure rooms, patient care areas, medical device reprocessing areas and sterile storage. Documentation of filter MERVs is on file.</p>		L		P, F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.6.5	<p>M Secondary filters have a minimum MERV rating of 14.</p> <p>Guidance: This is the minimum MERV rating for filters serving operating rooms, procedure rooms, patient care areas, medical device reprocessing areas and sterile storage. Where present, specialized operating room (transplants, orthopedics) have three levels of filtration (primary filters, secondary filters and HEPA filters). Documentation of filter MERVs is on file.</p>		L		P, F
HVAC1.6.6	<p>M Filters and seals are visually inspected monthly.</p> <p>Guidance: The condition of the primary and secondary filters and seals serving the semi-restricted and restricted areas of the facility are verified by visual inspection, at minimum, once a month. Note: primary filters and seal with a capacity less than MERV 9 shall undergo visual inspection at least once a week. In cases where filters cannot be inspected visually, alternate provisions for inspection are undertaken. Where filters cannot be visually inspected, the medical director in consultation with a qualified HVAC technician determine the alternate provisions for inspection and there is a letter/memorandum on file signed by the medical director and qualified HVAC technician that details the alternative provisions. The facility medical director is responsible for ensuring that the person performing the inspection/checking or preventative maintenance is appropriately qualified. Documentation of monthly inspections of the filters and seals are on file.</p>		M		F
HVAC1.6.7	<p>M Primary filters are replaced if there are signs of physical damage, deterioration or mould.</p> <p>Guidance: Filters must be replaced when loaded (based on measurements of pressure drop across the filter bank) or if these are signs of physical damage, deterioration to the filter media or frame or mould. Primary filters should not remain in service for more than 12 months. Documentation of filter MERVs, inspection and their replacement are on file.</p>		M		F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.6.8	<p>M Secondary filters are replaced if there are signs of physical damage, deterioration or mould.</p> <p>Guidance: Filters must be replaced when loaded (based on measurements of pressure drop across the filter bank) or if these are signs of physical damage, deterioration to the filter media or frame or mould. Secondary filters should not remain in service for more than 24 months. Documentation of filter MERVs, inspection and their replacement are on file.</p>		M		F
HVAC1.6.9	<p>M HEPA filters are replaced if there are signs of physical damage, deterioration or mould.</p> <p>Guidance: Filters must be replaced when loaded (based on measurements of pressure drop across the filter bank) or if these are signs of physical damage, deterioration to the filter media or frame or mould. Where present, specialized operating room (transplants, orthopedics) have three levels of filtration (primary filters, secondary filters and HEPA filters). HEPA filters should not remain in service for more than 36 months. Documentation of HEPA filters, inspection and their replacement are on file.</p>		M		F
HVAC1.6.10	<p>M Fan coils, drain pans and induction and finned units are inspected and cleaned semi-annually.</p> <p>Guidance: The fan coils, drain pans and induction and finned units are kept clean, free of debris and are inspected and cleaned on a seasonal basis, usually spring and fall. More frequent cleaning may be needed in areas with high volumes of insects. The facility medical director is responsible for ensuring that the person performing the inspection/checking or preventative maintenance is appropriately qualified. Documentation of fan coil, drain pan and induction and finned units inspection and cleaning are on file.</p>		L		F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.6.11	<p>M Fire and smoke dampers are tested at minimum once every five years to ensure proper operation.</p> <p>Guidance: Damper testing involves activating the device and visual inspection of the operation and seal of the damper. Documentation of testing is on file at the facility.</p>		L		F
HVAC1.6.12	<p>M Dampers that are part of the smoke management system are tested annually.</p> <p>Guidance: Testing records are on file at the facility.</p>		L		F
HVAC1.6.13	<p>M Supply ducts are inspected annually and cleaned when deemed necessary by annual inspection.</p> <p>Guidance: HVAC system ducts are inspected, at minimum, annually. The facility medical director is responsible for ensuring that the person performing the inspection/checking or preventative maintenance is appropriately qualified. Records of the duct inspection including the need for cleaning or not and records of cleaning are on file at the facility. Supply and return ducts are cleaned in accordance with the National Air Duct Cleaners Association (NADCA) General Specifications for the Cleaning of Commercial Heating, Ventilation and Air conditioning Systems and verification of their cleanliness is in accordance with the NADCA) Assessment, Cleaning and Restoration of HVAC systems.</p>		L		F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.6.14	<p>M Return ducts are inspected annually, cleaned when deemed necessary by annual inspection and at least once every 10 years.</p> <p>Guidance: HVAC system ducts are inspected, at minimum, annually. The facility medical director is responsible for ensuring that the person performing the inspection/checking or preventative maintenance is appropriately qualified. Records of the duct inspection including the need for cleaning or not and records of cleaning are on file at the facility. Supply and return ducts are cleaned in accordance with the National Air Duct Cleaners Association (NADCA) General Specifications for the Cleaning of Commercial Heating, Ventilation and Air conditioning Systems and verification of their cleanliness is in accordance with the NADCA Assessment, Cleaning and Restoration of HVAC systems.</p>		L		F
HVAC1.6.15	<p>M Exhaust ducts are inspected annually, cleaned when deemed necessary by annual inspection and at least once every 10 years.</p> <p>Guidance: HVAC system ducts are inspected, at minimum, annually. The facility medical director is responsible for ensuring that the person performing the inspection/checking or preventative maintenance is appropriately qualified. Records of the duct inspection including the need for cleaning or not and records of cleaning are on file at the facility.</p>		L		F
HVAC1.6.16	<p>M Diffusers are cleaned every six months.</p> <p>Guidance: Supply, return and exhaust diffusers are mechanically cleaned, at minimum, every 6 months. The facility medical director is responsible for ensuring that the person performing the inspection/checking or preventative maintenance is appropriately qualified. Records of diffuser cleaning are on file at the facility.</p>		L		F

No.	Description	Reference	Risk	Change	Asmt.
HVAC1.7	<p>Policies and procedures contain all of the information necessary for the safety of patients, staff and visitors.</p> <p>Guidance: Policies and procedures ensure that activities/procedures are performed consistently and accurately by all personnel within the non-hospital facility.</p>				
HVAC1.7.1	<p>M There is policy and procedures for HVAC system maintenance.</p> <p>Guidance: The policy and procedures outline a coordinated operation and maintenance program (COMP) for the HVAC system including the person/contractor/company responsible for the operation and maintenance of the system including regular inspection, cleaning, repair and maintenance of all components and measures taken should the system not be functioning within the appropriate parameters (e.g. rescheduling or delaying procedures). The COMP details the major components and equipment of the system (e.g. air-handling units, heat pump, cooling towers, filters, seals etc.), their preventative maintenance procedures (e.g. filter change, fan coil cleaning, duct inspections and cleaning), the required frequency of preventative maintenance (e.g. weekly, monthly, quarterly, semi-annually, annually) and required documentation (e.g. maintenance logs). The medical director is responsible for ensuring that the person or company performing the HVAC system operation and maintenance is qualified by education, training and experience to do the work and has clearly defined responsibilities.</p>		L		P, F

References

1. American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE). HVAC design manual for hospital and clinics. 2nd ed. Atlanta, GA: ASHRAE; 2013. 314 p.
2. Association of periOperative Registered Nurses (AORN). Guidelines for perioperative practice 2018 edition. Denver, CO: AORN; 2018. Guideline for safe environment of care, part 2; p. 269-93.
3. Canadian Standards Association. Operation and maintenance of health care facilities. Toronto: Canadian Standards Association; 2014. [reaffirmed 2018]. CSA Standard: Z8002:14.
4. Canadian Standards Association. Special requirements for heating, ventilation and air-conditioning (HVAC) systems in health care facilities. Toronto: Canadian Standards Association; 2015. CSA Standard: Z317.2-15.
5. College of Physicians and Surgeons of Alberta. Non-hospital surgical facility: standards & guidelines - March 2016, v23 [Internet]. Edmonton, AB: College of Physicians and Surgeons of Alberta; 2016 [cited 2019 Apr 1]. 62 p.
6. College of Physicians and Surgeons of Ontario. Out-of-hospital premises inspection program (OHPIP) - program standards [Internet]. Toronto: College of Physicians and Surgeons of Ontario; 2013 [revised 2017 Oct; cited 2019 Apr 1]. 44 p.
7. Operating Room Nurses Association of Canada (ORNAC). The ORNAC standards, guidelines, and position statements for perioperative registered nurses. 13th ed. Toronto: CSA Group; 2017. 469 p.

Revision history

Date	Revisions
June 28, 2019	Operating rooms and procedure rooms <ul style="list-style-type: none"> • Equipment and supplies are not to obstruct the return ducts. HVAC system maintenance <ul style="list-style-type: none"> • Testing of fire and smoke dampers added. Other <ul style="list-style-type: none"> • Substantial format changes and guidance added
April 1, 2026	Transcribed to new template (no content changes) (version 1.5)