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Owner	Sherie Goldbach: Project Coordinator
Policy Area	Infection Prevention
Applicability	UNC Medical Center
Policy Tag Groups	Infection Prevention

Infection Prevention for Plant Engineering/Facilities

I. Description

Describes the infection prevention guidelines for maintaining the physical environment of the hospital and healthcare facilities.

II. Policy

A. Personnel

1. Standard and Isolation Precautions
    a. When it is necessary to encounter contact with patients' body fluids (e.g., repairing sewer lines, toilets, vacuum lines), personal protective equipment (PPE) (e.g., gloves, gowns, and/or goggles, masks, face shields) must be worn.
    b. If disposable nitrile gloves are inadequate to protect from blood exposure, utility gloves may be used to protect hands from blood and other potentially infectious materials.
        i. Reusable utility gloves will be decontaminated using an EPA-registered disinfectant if the integrity of the gloves is not compromised.

ii. Utility gloves must be discarded if they are cracked, peeling, torn, punctured, or exhibit other signs of deterioration or when their ability to function as a barrier is compromised.

c. Hand hygiene must be performed after gloves are removed.

d. All staff will follow the Infection Prevention policy: Isolation Precautions and any instructions addressed on the isolation precaution sign posted outside the patient's room.

e. Equipment and tools (pliers, wrenches, hammers, etc.) must be disinfected with an EPA-registered disinfectant (i.e., Sani-Cloth, bleach wipes, Metriguard) after use in an isolation precautions room and when visibly soiled.

B. Maintenance of Buildings

1. All surfaces (floors, walls, and ceilings) require inspection and repair, when necessary, in order to maintain smooth, dry, and cleanable surfaces. Water leaks, intrusions, or water-soaked walls can become reservoirs for fungus.
2. Any openings or breaks in the walls, foundations, window frames, etc., require repair to maintain a clean environment.
3. UNC Hospitals staff will report need for repairs to their supervisors. The staff member or supervisor (or designee) will place a work order/maintenance request using the Plant Engineering (PE)/Facilities online maintenance request form or call your facility's maintenance department for emergent situations.

C. Equipment and Repairs

1. Water Treatment

    a. Domestic Potable Water Primary Treatment

        i. The domestic potable water supply is treated, disinfected, tested, and approved as safe by municipal water supplier using a combination of physical and chemical processes in accordance with state and federal regulations.

        ii. Carbon filters are designed to improve the taste of water but also filter out chlorine and other chemical disinfectants, increasing the risk of bacterial contamination. Carbon filters will be prohibited in inpatient acute care areas.

    b. Domestic Potable Water Secondary Treatment

        - The domestic potable water supply (cold and hot) to the Bone Marrow Transplant Unit (BMTU) on 1st Floor Neuroscience

Hospital and 5-Children's Protective Environment Unit in the Children's Hospital will be served by a secondary treatment system (copper-silver ionization). The system will be maintained in accordance with manufacturer's recommendations.

c. Domestic Potable Hot Water

    i. Domestic hot water systems will utilize recirculation pumping and piping technology to maintain continuous flow in hot water distribution loops.

    ii. Water heaters will be of the instantaneous low-volume type or tank type with recirculation.

d. Cooling Towers and Condenser Water

    i. Cooling tower condenser water will be chemically treated with inhibitors, dispersants, and biocides in accordance with industry/vendor best practice standards to protect against fouling, corrosion, scale, and microbiological growth. Water quality parameters and chemical feeds will be controlled, monitored, adjusted, and maintained by automated water treatment controllers and chemical treatment vendor technicians.

    ii. Cooling towers will be cleaned and disinfected annually in accordance with industry/vendor best practice standards.

    iii. Cooling tower condenser water makeup will be either by domestic potable water supply or by reclaimed water, both of which are treated by the public water supplier using a combination of physical and chemical processes in accordance with state and federal regulations.

e. Humidifiers in Central Air Handling

    - Steam for central air-handler humidification will be provided either by local steam generators fed directly by a domestic potable water supply or by central plant steam that has been treated in accordance with industry/vendor best practice standards.

f. During terminal cleaning of patient rooms - turn on all water faucets (e.g., for a minimum of 1 minute, or 2-3 activations with foot pedal, or button activations) on all sinks and showers, as well as flush the toilet before cleaning per the Infection Prevention policy: Environmental Services.

2. Ventilation system

    a. Air filters will be monitored as indicated in the Environmental Health and Safety policy: Safety and Infection Prevention Management Plan for

Construction, Renovation, and Modernization Projects, which details the requirements and monitoring for filters, pressures, and air changes for the locations identified to have the highest impact for infection prevention. From an infection prevention and control perspective, temperature and relative humidity monitoring are not necessary so long as temperature and relative humidity are not excessive (temperature >90°F, relative humidity >80% for longer than 48 hours).

b. Disposable filters are never cleaned or reused.

c. All roughing filter beds will be visually inspected every 3 months to ensure that unfiltered air does not bypass the filters because of leaks around the filter frames or holes in the filters. N95 respirators (fit-testing required) are available to staff for use when filters are changed.

d. Air exchange rates and the air pressure differential between patient rooms and the adjacent corridor will be checked as requested by the Infection Prevention Department. Rooms used for isolation of patients on Airborne Precautions will be monitored annually. The results will be kept on file by Plant Engineering/Facilities for a period of 3 years, and a copy of annual monitoring results will be sent to Infection Prevention. Rooms of patients on Airborne Precautions are to be monitored and documented daily by the nursing staff when used for Airborne Precautions using the "tissue test" per the Infection Prevention policies: Isolation Precautions and High Consequence Pathogens: - Preparedness and Response Plan.

e. To preclude bypass of unfiltered air, all hospital windows will remain closed, and outside doors will remain closed when not in active use.

f. When cleaning dust from behind vent covers in patient rooms, use a damp cloth or HEPA-filtered vacuum cleaner. This cleaning should only be done when the patient is not in the room, and the door closed. The room should remain unoccupied for 30 minutes, if possible, before terminal cleaning is performed.

3. Ice Machines

   - Ice machines will be inspected, cleaned, and maintained on a regular maintenance schedule. Refer to Attachment 1 - Sanitary Care and Maintenance of Ice Chests and Ice Machines.

4. Automatic sensor sinks

   - Automatic sensors will not be installed in Bone Marrow Transplant Unit (BMTU), 5-Children's Protective Environment (5CH), and the Burn Intensive Care Unit (BICU) patient rooms.

5. Other Equipment and Repairs

a. Perform routine inspection and servicing of all plumbing, heating, refrigeration, steam supplies, electrical, and air-conditioning systems. Maintenance records will be prepared on all routine inspections and servicing and will be kept on file for 3 years.

b. The computerized pneumatic tube system is maintained and cleaned as per hospital policy. The McLendon Labs and Plant Engineering/Facilities have separate functions in ensuring the maintenance of this system. Please refer to specific departmental procedures for Plant Engineering/Facilities and UNCH Operational Policies and Procedures for further details. Staff should comply with the guidelines found in the Plant Engineering policy: Pneumatic Tube System for decontaminating specimen spills in the tube system.

6. Ceilings and Leaks

a. Plant Engineering/Facilities Department occasionally must enter ceilings to perform repairs, inspections, or maintenance. An effective barrier system for dust and mold containment is required in areas housing and treating these highest risk patients (See Attachment 2 - Precautions for Patients in Clinical Areas Where Ceiling Work Is Planned). Clean containment booths must be cleaned according to the manufacturer's instructions for use (MIFU).

b. When Plant Engineering/Facilities staff find stains suggestive of leaks (e.g., ceiling tiles, walls), they should investigate the source of the stain, correct the leak as needed, and ensure there are no wet structural materials or mold (hidden or visible) resulting from the leak. If mold is found, contact Environmental Health and Safety, Infection Prevention, and develop a remediation plan. Stained ceiling tiles should be replaced, or other affected areas, such as a wall, should be repaired and painted after this investigation has been completed and the source mitigated. Carpeting that remains wet after 72 hours will be replaced. Carpet that is soiled by sewage spills should be replaced regardless of the time it remains wet.

c. Infection Prevention and Environmental Health and Safety should be notified by Plant Engineering/Facilities about any leak that is recurrent and/or associated with mold in adjacent areas.

d. Water intrusion/leaks will be managed in accordance with CDC Environmental Infection Control Guidelines available on the CDC website.

7. Sinks

a. Aerators on scrub sink faucets are to be replaced annually as part of a scheduled preventative maintenance program.

b. Aerators on sink faucets in ICUs are to be replaced annually as part of a scheduled preventative maintenance program.

8. Decorative Water Fountains/Water Walls

    - Decorative water fountains, water walls, or water features are prohibited in the indoor environment.

D. Hospital Renovations/Construction

- All renovations/construction plans at UNC Hospitals will be reviewed by Infection Prevention to maintain the air quality in the hospital and to ensure appropriate considerations have been made to infection prevention and control issues. The procedure details are provided in the Environmental Health and Safety policy: Safety and Infection Prevention Management Plan for Construction, Renovation, and Modernization Projects.

E. Implementation

The implementation and enforcement of this policy is the responsibility of the Director of Plant Engineering/Facilities.

III. Responsible for Content

Infection Prevention

IV. References

Centers for Disease Control and Prevention. Guidelines for Environmental Infection Control in Health-Care Facilities. 2003. Updated July 2019

Does a mobile dust-containment cart reduce the risk of healthcare-associated fungal infections during above-ceiling work? Buchanan MO, Thompson SC, DiBiase LM, Sickbert-Bennett EE, Weber DJ. Infection Control and Hospital Epidemiology. 2021 Apr; 42(4). 477-479; doi: 10.1017/ice.2020.469

Facility Guidelines Institute. *Guidelines for design and construction of hospitals and outpatient facilities.* St. Louis, MO: Facilities Guidelines Institute; 2022.

Review of fungal outbreaks and infection prevention in healthcare settings during construction and renovation. Kanamori H, Rutala WA, Sickbert-Bennett EE, Weber DJ. Clin Infect Dis. 2015 Aug 1;61(3):433-44. doi: 10.1093/cid/civ297.

V. Related Policies

Environmental Health and Safety Policy: Safety and Infection Prevention Management Plan for Construction, Renovation, and Modernization Projects

Infection Prevention Policy: Environmental Services

Infection Prevention Policy: Exposure Control Plan for Bloodborne Pathogens

Infection Prevention Policy: Hand Hygiene

Infection Prevention Policy: High Consequence Pathogens: Preparedness and Response Plan

Infection Prevention Policy: Isolation Precautions

Infection Prevention Policy: Tuberculosis Control Plan

Occupational Health Services Policy: Infection Prevention and Screening Program – Occupational Health Service

Plant Engineering Policy: Pneumatic Tube System

All Revision Dates

03/2026, 03/2023, 05/2022, 06/2020, 10/2017, 02/2017, 02/2014, 08/2013, 08/2011, 05/2009, 09/2006, 08/2004

Attachments

1: Sanitary Care and Maintenance of Ice Chests and Ice Machines

2: Precautions for Patients in Clinical Areas Where Ceiling Work is Planned

Approval Signatures

Step Description	Approver	Date
Policy Stat Administrator	Judith Strubin: Mgr Program-IP	03/2026
AVP Quality UNCMC	Erin Burgess: HCS Exec Dir Quality Improvement Complex AMC	03/2026
Dir Epidemiology	Emily Vavalle: HCS Exec Dir Infection Prevention	03/2026
	Sherie Goldbach: Project Coordinator	03/2026

Applicability

UNC Medical Center