

INFECTION CONTROL GUIDELINE CONSTRUCTION AND RENOVATION

OBJECTIVE: To prevent the acquisition of nosocomial infections in-patients and healthcare workers during medical center renovations or construction activities.

POLICY:

1. All renovation or construction projects will be reviewed with Infection Control during the planning phases.
2. Infection Control will participate in meetings and area walk-through inspections as necessary.
3. All construction workers, including subcontractors, and Facilities Management employees, must follow the infection control procedures as described in the guideline.
4. Appropriate pre-employment screening must be completed prior to starting work in clinical areas.

PLANNING PHASE

Infection Control will be involved in the planning phases for all renovation and new construction projects specific to the following major components (schematic design):

1. Number and placement of isolation rooms.
2. Air handling systems; use of adjunctive measures such as ultraviolet germicidal irradiation (UVGI).
3. Number and placement of hand washing facilities.
4. Staff and patient traffic patterns for the duration of the project.
5. Relocation decisions regarding patient care areas, storage areas, etc.
6. Water supply and plumbing.
7. Construction waste containment, transport and disposal.
8. Selection and installation of medical equipment as it relates to infection control.
9. Selection of finishes and surfaces that can be effectively cleaned.
10. Accommodation of personal protective equipment (accessibility, security, sanitation, etc.).
11. Storage of moveable equipment.

OPERATIONAL PHASE

1. Medical Waste

a. Hospital staff shall ensure the removal of any medical waste, including sharps containers, from areas to be renovated or constructed **PRIOR** to the start of the project.

b. Infection Control shall be notified by Facilities Management staff immediately if unexpected medical waste is encountered.

2. Barrier Walls

Construction or renovation sites must be separated from patient-care areas and critical areas such as SPD and Pharmacy by barriers that keep the dirt and dust inside the worksite.

- a. The integrity of the barrier walls must assure a complete seal of the construction area from adjacent areas.
- b. Rigid construction or fire-rated plastic sheeting (4 or 6 mil thickness) are used, depending on the location of the project, adjacent uses, and duration of the project.
- c. Walls will be dustproof with airtight seals maintained at the full perimeter of the walls as well as all penetrations.

3. Environmental Control

a. Negative air pressure will be maintained within the construction zone with no disruption of the air systems of the adjacent areas, depending on project location. A HEPA (High Efficiency Particulate Accumulator) filter vacuum system rated at 95% capture of 0.3 microns (effective for pollen, mold spores, and dust particles) shall be installed to insure continuous negative air pressures within the work area. There should be no recirculation of air, and ventilation filters will be changed as needed.

b. Demolition debris will be removed from the construction area in tightly fitted covered carts using specified traffic patterns daily.

c. Tacky or walk-off mats shall be utilized immediately outside the construction zone to remove dust and soil from shoes, cart wheels, etc. as personnel exit the area. The tacky mat must be large enough to cover the entire exit and is changed whenever necessary.

d. Exterior window seals must minimize infiltration of outside excavation debris. Windows will remain closed at all times.

e. When using demolition chutes, chute openings must be sealed when not in use. The chute and damper should be sprayed with water, as necessary, to maintain dust control.

f. Control, collection and disposal must be provided for any drain liquid or sludge encountered when demolishing plumbing.

4. Traffic Control

a. Designated entry and exit procedures will be defined (in conjunction with any necessary Interim Life Safety Measures) for each construction project where applicable.

b. All egress pathways will be free of debris.

c. Unauthorized personnel will not be allowed to enter the construction zone.

d. Only designated elevators will be used for construction activities during scheduled times.

5. Cleaning

a. The construction zone and adjacent entry areas shall be maintained in a clean and sanitary manner by the contractors and will be swept and wet mopped daily or more frequently as needed to minimize dust generation.

b. Environmental Management Service may be responsible for the routine cleaning of adjacent areas and for the terminal cleaning of the construction zone prior to the opening of the newly renovated or constructed area. Specific responsibility will be defined in the construction contracts.

6. Personnel Requirements

a. Clothing shall be free of loose soil and debris upon exiting the construction zone.

b. Personal protective equipment, including face shield, gloves, and N95 respirators will be utilized as appropriate.

c. Personnel entering sterile/invasive procedure areas will be provided with a disposable jumpsuit, head covering and shoe coverings, which must be removed prior to exiting the work area.

(1) Tools and equipment must be damp-wiped prior to entry and exit from sterile and invasive procedure areas.

(2) Tools and equipment soiled with blood and body fluids will be cleaned with an approved germicide.

d. All contractors, subcontractors and Facilities Management employees shall receive infection control training as it relates to construction.

7. Environmental Monitoring

a. Infection Control, in conjunction with Facilities Management and Safety, will plan for environmental monitoring as appropriate for the project.

8. Completion Phase

a. After completion of construction, ventilation will meet specifications as mandated by regulatory bodies.

b. The area will be thoroughly cleaned and disinfected before being placed into service.

c. Water supply lines will be flushed before placing newly renovated or constructed areas in service. Infection Control shall be notified prior to the flushing.

d. Industrial Hygiene shall certify that water supply lines are safe for use.

9. Compliance Monitoring

a. Medical Center staff (Contracting Officer (COR), Safety Representative and Infection Control) and the contractor will conduct compliance monitoring as necessary to insure patients, staff, visitors and contractors are safe. The following parameters may be monitored:

(1.) Air handling

- (2.) Integrity of barrier walls
- (3.) Dress code
- (4.) Environmental control
- (5.) Traffic control
- (6.) Personal protective equipment
- (7.) Water supply

Infection control risk assessment for construction, renovation, and maintenance

PROCEDURE:

The Infection Control Construction/Maintenance Risk Assessment consists of three steps:

- (1) Determination of the construction/maintenance activity type;
- (2) Identification of infection control risk group, to include the need for the contractor to have a TB screening;
- (3) Class type assigned to each project.

The class type then determines the guidelines necessary for the project.

Step 1: Identify the type of Construction Activity using the following table.

DEFINITION OF CONSTRUCTION ACTIVITY
Type A: Inspections and General Upkeep Activities. Includes but is not limited to; removal of ceiling tiles for visual inspection (limited to 1 tile per 50 square feet); painting (but not sanding); installation of wall covering; electrical trim work; minor plumbing; and activities, which do not generate dust or require cutting into walls or access to ceilings other than for visual inspection.
Type B: Small scale, short duration activities, which create minimal dust. Includes but is not limited to, installation of telephone and computer cabling, access to chase spaces, cutting into walls or ceiling where dust migration can be controlled.
Type C: Any work that generates a moderate to high level of dust. Includes, but is not limited to, demolition or removal of built-in building components or assemblies, sanding of wall for painting or wall covering, removal of floor covering/wallpaper, ceiling tiles and casework, new wall construction, minor ductwork or electrical work above ceilings, major cabling activities.
Type D: Major demolition and construction projects. Includes, but is not limited to, heavy demolition, removal of a complete ceiling system, and new construction.

Step 2: Identify the Patient Risk Groups that will be affected using the following table: If more than one risk group will be affected, select the higher risk group:

DEFINITIONS OF INFECTION CONTROL RISK AREAS/LOCATIONS				
Group 0 Lowest	Group 1 Low	Group 2 Medium	Group 3 Medium High	Group 4 Highest
<ul style="list-style-type: none"> Detached buildings 	<ul style="list-style-type: none"> Office Areas Areas not communicating with patient care activities 	<ul style="list-style-type: none"> Patient care & other areas not covered under group 3 or 4 Laundry Cafeteria Dietary Materials Management PT/OT/Speech Admission/Discharge MRI Nuclear Medicine Echocardiography Laboratories not specified as group 3 Public Corridors 	<ul style="list-style-type: none"> Emergency Rooms Radiology Post-anesthesia care units Intensive Care Units Microbiology Lab Long term/sub-acute units Pharmacy Dialysis Endoscopy Bronchoscopy areas 	<ul style="list-style-type: none"> Chemotherapy Sterile Processing Services Operating Rooms Radiation Therapy Pharmacy Admixture Cardiac Catheterization Outpatient Invasive procedure rooms

Step 3: Find the Class of Precautions (0, I, II, III, IV) for infection control activities required.

Match the Construction Project Type (A, B, C, D) with the **Patient Risk Group** (low, medium, high, highest) on the IC Matrix to determine Classes of precautions. Infection Control procedures are described in the table following the matrix.

Construction Activity Matrix: Class of Precautions for Construction Projects by Patient Risk

Construction Activity Matrix				
RISK LEVEL	TYPE "A"	TYPE "B"	TYPE "C"	TYPE "D"
GROUP 0	Class 0	Class 0	Class 0	Class 0
GROUP 1	Class I	Class II	Class II	Class III/IV
GROUP 2	Class I	Class II	Class III	Class IV
GROUP 3	Class I	Class III	Class III/IV	Class IV
GROUP 4*	Class III	Class III/IV	Class III/IV	Class IV

*Any work to be completed in Highest Risk area will be assessed on an individual basis.

Description of Required Infection Control Precautions by Class

INFECTION CONTROL CONSTRUCTION GUIDELINES	
CLASS 0	<ul style="list-style-type: none"> No infection control measures required.
CLASS I	<ul style="list-style-type: none"> Execute work by methods to minimize raising dust from construction operations. Replace any ceiling tile displaced for visual inspection as soon as possible Wipe work surface with disinfectant upon completion of project.
CLASS II	<ul style="list-style-type: none"> Provide active means to prevent air-borne dust from dispersing into atmosphere. Seal unused doors with duct tape. Contain construction waste before transport in tightly covered containers. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area daily. Place dust-mat at entrance and exit of work area and replace or clean when no longer effective. Isolate HVAC system in areas where work is being performed. Wipe casework and horizontal surfaces at completion of project.
CLASS III	<ul style="list-style-type: none"> Isolate HVAC system in area where work is being done to prevent contamination of the duct system. Complete all construction barriers before construction begins. Maintain negative air pressure within work site utilizing HEPA filtered ventilation units or other methods to maintain negative pressure. Engineering will monitor air pressure. Do not remove barriers from work area until complete project is thoroughly cleaned. Wet mop or vacuum twice per 8-hour period of construction activity or as required in order to minimize tracking. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. Barrier material should be wet wiped, HEPA vacuumed or water misted prior to removal. Contain construction waste before transport in tightly covered containers. Place dust-mat at entrance and exit of work area and replace or clean when no longer effective. Wipe casework and horizontal surfaces at completion of project.

CLASS IV	<ul style="list-style-type: none"> • Isolate HVAC system in area where work is being done to prevent contamination of duct system. • Complete all construction barriers before construction begins. • Maintain negative air pressure within work site utilizing HEPA filtered ventilation units or other methods to maintain negative pressure. Engineering will monitor air pressure. • Seal holes, pipes, conduits, and punctures to prevent dust migration. • Construct anteroom and require all personnel to pass through this room. Wet mop or HEPA vacuum the anteroom daily. • During demolition, dust producing work or work in the ceiling, disposable shoes and coveralls are to be worn and removed in the anteroom when leaving the work area. • Do not remove barriers from work area until completed project is thoroughly cleaned. • Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. • Barrier material should be wet wiped, HEPA vacuumed or water misted prior to removal. • Contain construction waste before transport in tightly covered containers. • Place dust-mat at entrance and exit of work area and replace or clean when no longer effective. • Keep work area room clean and remove debris daily. • Wet mop hard surface areas with disinfectant at completion of project. HEPA vacuum carpeted surfaces at completion of project. • Wipe casework and horizontal surfaces at completion of project.
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