01.38 Hospital Construction, Renovation, and Demolition

Purpose
To provide infection control guidelines for hospital construction, renovation, and demolition.

Audience
Facilities Operation and Management (FOAM), contractors, Hospital Administration.

Infection Control Risk Assessment (ICRA)

A. An assessment of risks to patients, healthcare workers, and the public will be done prior to planning for any renovation, construction, or demolition project in or near any UTMB hospital or clinic.

B. The assessment will be carried out by a committee made up of representatives from the Department of Healthcare Epidemiology, Hospital Administration and FOAM.

C. Each risk assessment shall include review of the following:
   1. Location of the project and susceptibility of the nearest patients to opportunistic infections.
   2. Planning for air handling and water systems/plumbing.
   3. Traffic patterns for patients, healthcare workers, and visitors.
   4. Transport and disposal of waste materials.
   5. Education of construction workers on containment of dust within the construction/renovation area.
   6. Occupational health expectations
      a. Identification of special risks to patients and staff
      b. Identification of special risks to construction workers
   7. Authority to determine if or how patient unit closure will occur and the method by which the information will be communicated.

   Documentation of the findings of the risk assessment shall become a part of the project file.

D. Patients should be transported to areas in the hospital where they have diagnostic or therapeutic procedures by routes that minimize their exposure to construction sites.

E. Education of construction workers about infectious diseases.
   1. Facility and contractor workers should be educated about infectious hazards they may encounter during the renovation/construction at the pre-construction conference.
   2. Individual worker education will be provided by the contractor.

F. Health protection for patients from construction workers.
   1. Requirements will vary with degree of environmental risk and proximity to the patient populations.
   2. Signs of symptoms of various contagious diseases shall be monitored by the contractor and reported to UTMB.
G. Immunocompromised patients

1. Prior to any construction/renovation or cable pulls the Nurse Manager of the unit will be notified.

2. 24 hours prior to the initiation of the work the patients on the unit will be assessed by the Nurse Manager.

3. Patients who have ever had a lung transplant or have an absolute neutrophil count of <500 in the last 24 hours must be moved to the opposite wing of the hospital or another floor prior to the initiation of the work.

4. If the patients cannot be moved because of bed capacity or illness, the renovations will be postponed.

5. Renovation/cable pulls in the ICU areas will be decided on a case by case basis.

Design of measures for protection

Design of measures to protect patients, healthcare workers, and the public from infections related to construction/renovation. (To be incorporated in special conditions section of the project specifications and discussed as a part of the pre-construction conference.)

A. Barriers will be used to isolate all construction/renovation projects from other areas in the hospitals/clinics.

Minimal dust generation.

Non-combustible or limited combustible

1. Barriers will be provided using fire rated plastic sheeting. (See Fire Prevention Department for approved materials.)

2. The portal(s) of entry through the plastic sheeting will have overlapping flaps that are at least 2 feet in width.

3. Plastic sheeting will extend from the floor to the deck above and will be sealed to prevent dust from escaping from the worksite.

Moderate to heavy dust generation.

1. Barriers will be dust-proof, smoke-barrier walls with caulked seams. All wall penetrations will be tightly sealed.

2. Walls will extend from the floor to the deck above.

3. Entry ways will have doors with gasketed door frames and doors with tight seals when closed.

4. Non-combustible or limited combustible plastic barriers will be installed prior to construction and removal of dust barrier walls.

B. All construction areas will be under negative pressure unless noted to the contrary.

1. Negative pressure must be monitored with an alarm device.

2. Air from the construction zone must be discharged to the outside after passing through pre-filters and 95% high efficiency filters and be discharged away from air intakes or public ways.
C. Ventilation systems
   1. All ventilation systems outside the construction area will be isolated from the construction area.
   2. Pressure relations must be checked and maintained in critical areas near construction sites throughout each construction project.
   3. All windows in the construction area will be sealed and seals checked periodically and repaired as needed.

D. Elevator Shafts
   1. Elevator shaft access shall be sealed if located in areas undergoing construction/renovation.

E. Pneumatic tube system
   1. Pneumatic tube system ports will be sealed in areas undergoing construction/renovation.

F. Removal of debris
   1. Debris must be removed in carts with tightly fitted covers.
   2. Traffic routes for removal of debris will be designated.
   3. When elevators are used for removal of debris, they must be used at the period of lowest activity by patients and healthcare workers.
   4. Debris must be removed daily.
   5. If a chute is used to discharge debris to the outside, the chute opening must be sealed when not in use.

G. Decontamination of construction workers prior to their exiting the worksite.
   1. Workers’ clothing must be free of loose soil and debris before they leave the construction area.
   2. When construction workers wear no protective apparel, their clothing must be cleaned with a HEPA-filtered vacuum prior to leaving the worksite.

H. Work site cleanliness
   1. The worksite must be swept or vacuumed with a HEPA-filtered vacuum daily to remove dust.
   2. Areas adjacent to the construction area must be damp mopped one or more times per day.
   3. Walk-off mats must be placed at worksite entrances to minimize tracking of dust by construction workers.
   4. Storage sites must be designated for construction materials, and they must be located as close to the construction site as possible.

I. Only authorized persons will be allowed to enter the construction zone.

J. Signage must direct pedestrian traffic away from construction areas.

K. It shall be the responsibilities of the contractor to provide terminal cleaning before newly renovated or constructed areas are opened.
Communication/Data Cables

A. Communication/data cables should be pulled in patient care areas after hours (clinic) and when the unit is non-operational. The sites of entry and exit of the cable will be HEPA vacuumed (ceiling tiles and pipes) before any work begins.

B. Cables should never be pulled over a patient’s bed. The patient(s) must be relocated before the job is initiated.

C. When cables must be pulled in an active unit a dust partition must be used at the site of entry and exit of the cable.

D. The dust partition may be attached to the false ceiling because taking it to deck may interfere with the work.

E. The site of entry and exit of the cable will be HEPA vacuumed (ceiling tiles and pipes) before the work begins.

F. An ICRA form will be completed on all work that requires dust containment.

Monitoring for Contamination

Monitoring for contamination/infection during and after renovation/construction.

A. Air samples may be taken for culture before, during, and after renovation/construction projects as deemed appropriate by the Department of Healthcare Epidemiology.

B. Water samples may be taken for culture before and after renovation/construction projects as deemed appropriate by the Department of Healthcare Epidemiology.

C. Continuous surveillance for infections related to renovation/construction will be done as deemed appropriate by the Department of Healthcare Epidemiology. Criteria for acceptable air quality in different types of patient care units are as follows:

1. Medical/Surgical patient care units
   a. Total spore counts $\leq$ 15 spores per cubic meter of air.
   b. Total pathogenic spore counts $\leq$ 3 spores per cubic meter of air.
      1) *Aspergillus* species
      2) Zygomycete species
      3) *Fusarium* species

2. Intensive care units, transplant units, oncology units
   a. Total spore counts $\leq$ 15 spores per cubic meter of air.
   b. No spores of pathogenic fungal species

3. Operating rooms
   a. Total spore counts $\leq$ 3 spores per cubic meter of air.
   b. No spores of pathogenic fungal species
Reference


## Infection Control Risk Assessment

**Project Name:** ____________________________  **Project Number:** ________________

**Project Manager:** ____________________________  **Project Location:** ________________

**Effected Locations:** ____________________________

**Start date of Project:** ____________________________

**Clinical Manager** notified 24° prior to start ______

**Healthcare Epidemiology** notified 24° prior to start ______

<table>
<thead>
<tr>
<th>Issue</th>
<th>Plan of Action</th>
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<tbody>
<tr>
<td>1</td>
<td>Type of dust protection</td>
</tr>
<tr>
<td>2</td>
<td>Negative pressure required</td>
</tr>
<tr>
<td>3</td>
<td>Pressure checked (beginning, middle, end of project)</td>
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<tr>
<td>4</td>
<td>Air discharged outside</td>
</tr>
<tr>
<td>5</td>
<td>Ventilation system isolated</td>
</tr>
<tr>
<td>6</td>
<td>Widows sealed</td>
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<tr>
<td>7</td>
<td>Elevator door sealed</td>
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<tr>
<td>8</td>
<td>Pneumatic tube system sealed</td>
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<tr>
<td>9</td>
<td>Workers decontaminated before they leave the site</td>
</tr>
<tr>
<td>10</td>
<td>Worksite is maintained clean</td>
</tr>
<tr>
<td>11</td>
<td>Signage is posted to reroute pedestrian traffic</td>
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<tr>
<td>12</td>
<td>Site is terminally cleaned before it is reopened for use</td>
</tr>
<tr>
<td>13</td>
<td>Water systems have no dead legs and have been adequately flushed</td>
</tr>
<tr>
<td>14</td>
<td>Staff have been educated about infection control risks of construction in the healthcare setting</td>
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**HCE Director:** ____________________________  **Contractor:** ____________________________

**Signature**  **Date**  **Signature**  **Date**

**UTMB Construction Manager:** ____________________________

**Signature**  **Date**