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INFECTION PREVENTION MANUAL FOR

**CONSTRUCTION
& RENOVATION**



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Association for Professionals in
Infection Control and Epidemiology

Infection Prevention Manual for Construction & Renovation



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Infection Prevention Manual for Construction & Renovation

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Introduction

The *Infection Prevention Manual for Construction & Renovation* was created to provide resources for infection preventionists (IPs) developing comprehensive infection control during construction programs. The manual provides policies and procedures, resources, models, examples, and educational material. This material can be used by new and experienced IPs and for facilities of different sizes and patient populations both as samples of how other facilities have developed their infection control during construction programs, and as templates to adapt for their own facilities.

The information within the chapters falls into three broad categories. One category is policies, procedures, and other documents to be used in developing an infection control risk assessment for construction, as well as tools for monitoring construction projects. The second category is information that can be used for the development of means and methods in healthcare construction; these should be utilized to develop a comprehensive infection control during construction program. The third category is information that demonstrates the complexity of the planning and building of construction projects. This information can be used to better understand the overall construction process and the role of infection prevention and control now and going forward.

The IP should be involved in projects from the initial planning stages through completion. A common challenge is lack of engagement from administration and getting support for infection control programs. One way to get support is to demonstrate the need for an infection control during construction program and the importance of input from IPs. Factors to highlight include the following:

- the need to comply with regulatory agencies, including state regulations, Facility Guidelines Institute (FGI), and the Joint Commission (TJC) requirements;
- the need to demonstrate to administration the value of the program;
- the need to demonstrate how input from IPs results in an enhanced outcome and/or where the lack of input resulted in an adverse outcome.

Possible examples include the placement and number of hand-washing sinks or the appropriate number of airborne isolation rooms. Stressing the need to protect patients, staff, and visitors from the risks associated with construction may also be beneficial. For example, *Aspergillus* infections related to construction are well known, as are allergic reactions from dust generated by construction.

Much of the information in this manual is available through the Internet links supplied. Although every effort has been made to verify these links, the location of the information may change. The material in this manual should be used as a starting point. The policies and procedures, checklists, and other documents may need to be modified to fit individual facilities' patient populations and facility designs. The IPs who contributed their time, resources, and expertise to the development of this manual hope that this material will be useful and provide motivation to share ideas and develop new tools to benefit the patients, staff, and visitors who use healthcare facilities.

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CHAPTER 1

Construction and Renovation Policies

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To create a safe environment of care for patients, visitors, healthcare workers, and contractors, the infection preventionist (IP) should incorporate a construction and renovation policy. The policy should cover all elements of construction and renovation projects in which infection prevention and control is involved. The policy should also state the need to have the IP as part of the project team from start to finish.

Include provisions about design and the guidelines that should be used (e.g., the Facility Guidelines Institute (FGI) guidelines) in the policy. The FGI guidelines provide in-depth explanations about infection control risk assessment (ICRA) requirements, timing, and who should be included on the team. Based on the results of the ICRA, the design of the space should be accommodated to meet the requirements. The FGI guidelines also explain the infection control risk mitigation recommendations (ICRMR), which address such areas as patient placement and relocation, standards for barriers, phasing, protection from demolition, training, impact of utility outages, removal and movement of debris, and use of bathrooms and food areas for construction contractors.

The IP should be included in all phases of construction project planning to ensure that such items as hand-wash sinks, soiled and clean utility rooms, and airborne isolation rooms are properly laid out to meet the needs of the space. The IP should meet regularly with the facility and/or project managers to discuss upcoming projects. This will help foster the relationship and ensure that infection prevention needs (e.g., design specifications and ICRA) are addressed. Making the effort to meet with the facilities department will allow the IP to be engaged in the construction process and more readily integrated into the core design team.

A notification process should be implemented so that the project manager alerts the IP of upcoming projects. This will allow an ICRA to be completed before construction begins. If a training program is required for contractors, it is important to add that into the policy. Training programs for contractors may be conducted on-site or via computer and should include components on safety and infection prevention expectations while working on the site. The facility may also want to incorporate ongoing training for contractors; this may be done on an annual basis.

A periodic walk-through of the construction and renovation project is also important to ensure that contractors are following all infection prevention control measures. This is important at the start of each phase of the construction process to ensure integrity of barriers and proper air flow, and to make sure that all specifications in the ICRA are being followed. Based on the scope of the project, a walk-through of the area at least weekly may be necessary.

If the ICRA dust control measures are not being followed, the IP needs the authority stated in the construction and renovation policy to stop the project immediately to ensure the safety of the construction surroundings. Project work should not restart until the IP and the project manager are satisfied that the issue has been addressed. If the IP does not have the authority to stop a project due to unsafe practices, the resources need to be readily available for notifying the appropriate person to ensure that safe practices are in use going forward for the duration of the project. In addition, the IP should also immediately notify the project manager and or/the superintendent of an infection prevention or other safety issues breach. The project manager should also inform the IP of any infection prevention concerns or breaches that may arise during the project.

The following document is an example of a construction and renovation policy in an acute care setting that has been endorsed by an infection prevention department.

POLICY: CONSTRUCTION AND RENOVATION

Purpose:

To provide parameters for safe design, construction, maintenance, and sustainability in the healthcare environment.

Policy:

- I. Infection risks, interventions, and control strategies must be considered in planning for new construction and/or renovation of healthcare facilities.
- II. An Infection Control Risk Assessment (ICRA) is developed for all projects that may impact the health of patients.
- III. The ICRA is multidisciplinary, documented assessment process intended to proactively identify and mitigate risks from infection that could occur during construction activities.
- IV. The ICRA process must take into account the patient population at risk, the nature and scope of the project, and the functional program of the healthcare facility.
- V. The ICRA determines the potential risk of transmission of various air- and waterborne biological contaminants in the facility.
- VI. The ICRA shall be a part of integrated facility planning, design, construction, and commissioning activities.

Definitions:

Infection Control Risk Assessment—tool used to stratify infection control risks associated with construction or renovation

Project Manager—assigned person(s) responsible to the project, may be corporate or entity assigned

Design phase—Components include conceptual phase, schematic and structural considerations, programming needs, financial aspects

Project Team—a multidisciplinary planning group that at a minimum should include representation from infection prevention, administration, facility operations, architect, engineer, project manager, and the contractor

Procedure:

see also : Lakes : Northland : Ridges : Southdale : University of Minnesota Medical Center, Fairview

I. Fairview Infection Prevention Process Elements:

- A. The infection prevention department will be notified prior to onset of construction/renovation projects that meet project notification criteria.
- B. The owner will ensure that architects and project planners follow the Facility Guidelines Institute (FGI) when designing and planning for construction activities.
- C. The infection prevention department reserves the right to seek outside consultant services as appropriate to the project.
- D. Contracted workers will receive training and/or information on infection prevention and control practices and risks in any Fairview facility. The project manager will ensure contracted worker education prior to the start of any project.
- E. Breaches in infection control practices will be reported to the assigned project manager(s)/infection prevention services.
- F. The project manager arranges for final construction cleaning, followed by a terminal/deep clean by environmental services prior to occupancy.
- G. The infection prevention department may request to conduct a walk-through upon completion of the project and prior to occupancy.
- H. Facility services/plant operations will develop a system that communicates all respective projects.
- I. The infection prevention department in collaboration with facilities will determine which projects require the completion and documentation of an Infection Control Risk Assessment (ICRA).
- J. The infection prevention department will communicate the findings and recommendations of the ICRA to the project manager(s) for review and distribution.

II. The ICRA Based on FGI Guidelines

- K. ICRA Timing:** Will be conducted during the early planning phase of the project, before construction begins, and continue throughout project construction.
- L. ICRA Team:** Will be conducted by a person or team with expertise in infection prevention, direct patient care, facility design, construction, and HVAC and plumbing systems when these systems are involved. The scope of the project will dictate others who may be involved.
- M. ICRA Recommendations:** Based on preconstruction ICRA, the owner shall provide the following recommendations to incorporate into the program:
1. Design recommendations generated by the ICRA.
 2. Infection control risk mitigation recommendations (ICRMRs).
- N. ICRA Design Elements:**
1. Number, location, and type of airborne isolation and protective environment rooms.
 2. Number, location, and type of plumbed hand-washing stations, hand sanitation dispensers, and emergency first-aid equipment (eyewash stations and deluge showers).
 - The number and location of hand-washing stations and hand-sanitation dispensers shall be determined by the functional program and the ICRA.
 - Hand-washing stations will be convenient and accessible for healthcare personnel and all other users.
 3. Special HVAC needs to meet the functional program and accommodate the services included in or affected by the project (e.g., surgical services, airborne isolation rooms, laboratories, pharmacies, and other special areas).
 4. Water systems to limit *Legionella* and other waterborne opportunistic pathogens.
- O. Surfaces and Furnishings:**
1. Existing code requirements are to be met.
 2. Easy to maintain, repair, and clean.
 3. Does not support microbial growth.
 4. Nonporous and smooth.
 5. See “FGI Design p. 18 A1.2–3.2.1.5 Surface selection characteristics and criteria” for additional detail.
- P. Construction Elements:** When conducting the ICRA and developing the mitigation requirements for building and site areas anticipated to be affected by construction, the following shall be addressed:
1. The impact of disrupting essential services to patients and employees.
 2. Determination of the specific hazards and protection levels for each designated area.
 3. Location of patients according to their susceptibility to infection and the definition of risks to each.

4. Impact of movement of debris, traffic flow, spill cleanup, and testing and certification of installed systems.
5. Assessment of external as well as internal construction activities.
6. Location of known hazards.

Q. Compliance Elements:

1. ICRA Documentation: The written record shall remain an active part of the project documents for the duration of the construction project and through commissioning. The ICRA is filed into the master file for the specific project.
2. ICRMRs (infection control risk mitigation recommendations). Written plans that describe the specific methods by which transmission of air- and waterborne biological contaminants will be avoided during construction as well as during commissioning, when HVAC and plumbing systems and equipment are started/restarted.

R. Risk Mitigation (ICRMR) is prepared by the team to address the following (please review FGI guidelines in addition to the following summarized list):

1. Standards for patient placement and barriers.
2. Temporary provisions or phasing.
3. Protection from demolition.
4. Measures taken to train (see FV section A)
5. Impact of utility outages, planned and unplanned.
6. Movement of debris, traffic flow, cleanup, egress plans for construction debris and supplies, and worker routes.
7. Provision for use of bathroom and food facilities by construction workers.
8. Storage and installation of materials (clean, dry, no water damage).

S. Monitoring Plan and Procedures

1. The owner shall provide monitoring plans for effective application of ICRMRs during the course of the project.
2. Provisions for monitoring shall include written procedures for emergency suspension of work and protective measures indicating the responsibilities and limitations of each party (owner, designer, contractor, and monitor).

T. Communication

1. Updates on ICRA compliance will be provided by the ICRA team.
2. Changes to the original design plans shall be documented, updated, and continually shared between the ICRA team and the designers/architects/planners, owner, and contractor.

Policy Owner:

FHS IP Operations Workgroup

Approved By:

FHS Infection Prevention Committee

Date(s):

Date Effective: 1/97

Date Revised: 10/97, 7/00, 9/00, 10/01, 3/05, 1/08, 2/08, 3/11

Related Information

Fairview Northland Construction Worker Education, Interim Life Safety Daily Inspection Checklist

*Source: Fairview Hospital, University of Minnesota Medical Center, Minneapolis, MN***Construction and renovation: interim life safety measures**

Interim life safety measures (ILSMs) were developed in response to an increase in fires in facilities, including healthcare facilities, due to high fire risk construction activities (e.g., welding, grinding). For the safety of the building occupants, the measures compensate for hazards caused by construction activity.

ILSMs are put into place when the Life Safety Code has deficiencies due to construction, renovation, or other impairments, such as sprinkler or smoke impairments, fire wall and fire door breaches, and other fire safety deficiencies that could put everyone in the building at risk. The Life Safety Code is written by the National Fire Protection Agency (NFPA) and adopted by local fire prevention authorities having jurisdiction. When the Life Safety Code is impaired for four hours or more, the fire department needs to be notified of the impairment and first responders need to understand the specific impairments in case of an emergency. For example, in a fire emergency where there are no sprinklers to extinguish the fire, the fire department needs to understand what they are responding to and be prepared.

The authority with jurisdiction during construction and renovation projects has the final decision on what needs to be followed in terms of ILSMs. This authority could be a city fire inspector or a state fire marshal. This person determines whether the facility meets the intent of the ILSMs and, if not, has the authority to deny opening or occupancy of the construction premises until the infractions are properly corrected.

The infection preventionist (IP) needs to work closely with the facilities department on ILSMs to ensure that infection prevention barriers and other precautions do not impede or negatively affect the provisions of the Life Safety Code. It is important to understand that the ILSMs will override the infection control risk assessment if impairments are present during any phase of construction. For example, a hard-wall barrier may be required by the ICRA for a certain construction project, but that hard barrier may be