Infection Control Risk Assessment (ICRA)

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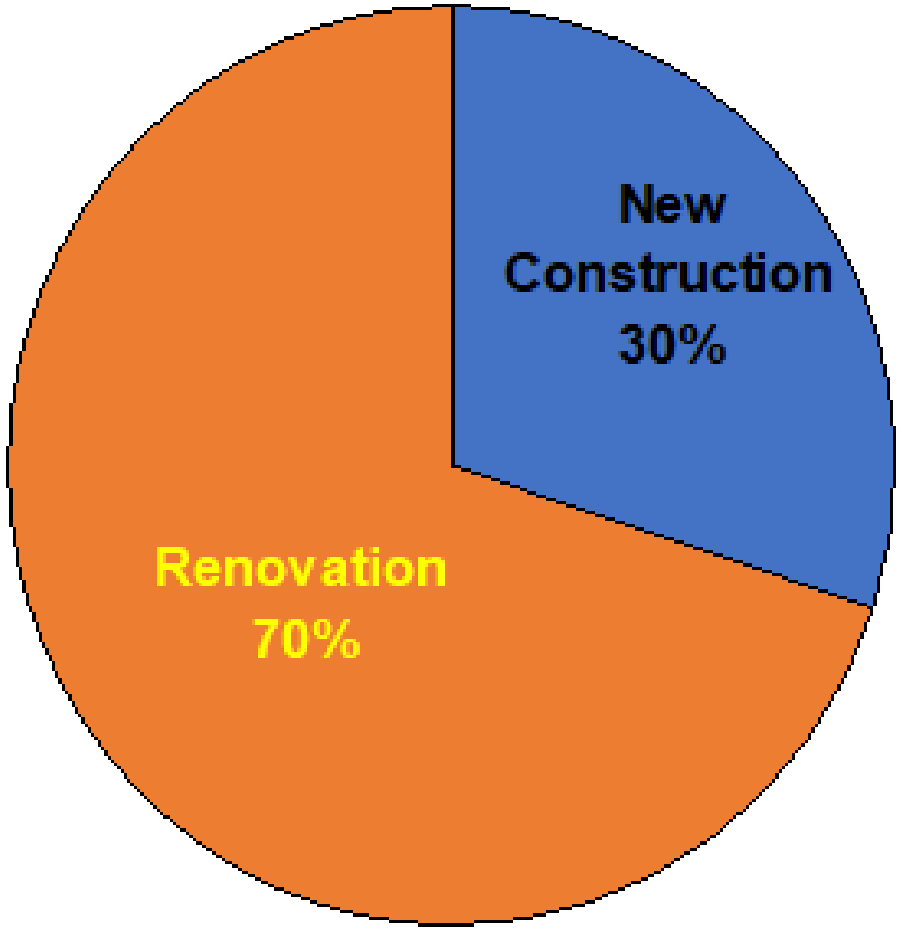
What We Will Cover Today

- Explanation of opportunistic infection
- Construction operations effects in Healthcare facilities
- Patient exposure scenarios
- Recent guidelines and standards
- ICRA Matrix Concept and Use
- General Contractor's Work Plan

Healthcare Construction



Patient Exposure

Construction activities can release pathogens into the built environment, HVAC or contaminate surfaces.

Contaminants such as fungi, bacteria, viruses and skin cells can cause Healthcare Associated Infections (HAIs)

Causes of Opportunistic Infection?

- Activities that cause increase of airborne *Aspergillus* spores
- Building demolition, construction, renovation, repair
- Bird/bat droppings in air ducts supplying high-risk patient care areas
- Contaminated fireproofing material
- Damp wood, sheet rock or other building materials

Patient Exposure

Increased risk immunocompromised patients

~ lung infection from inhalation

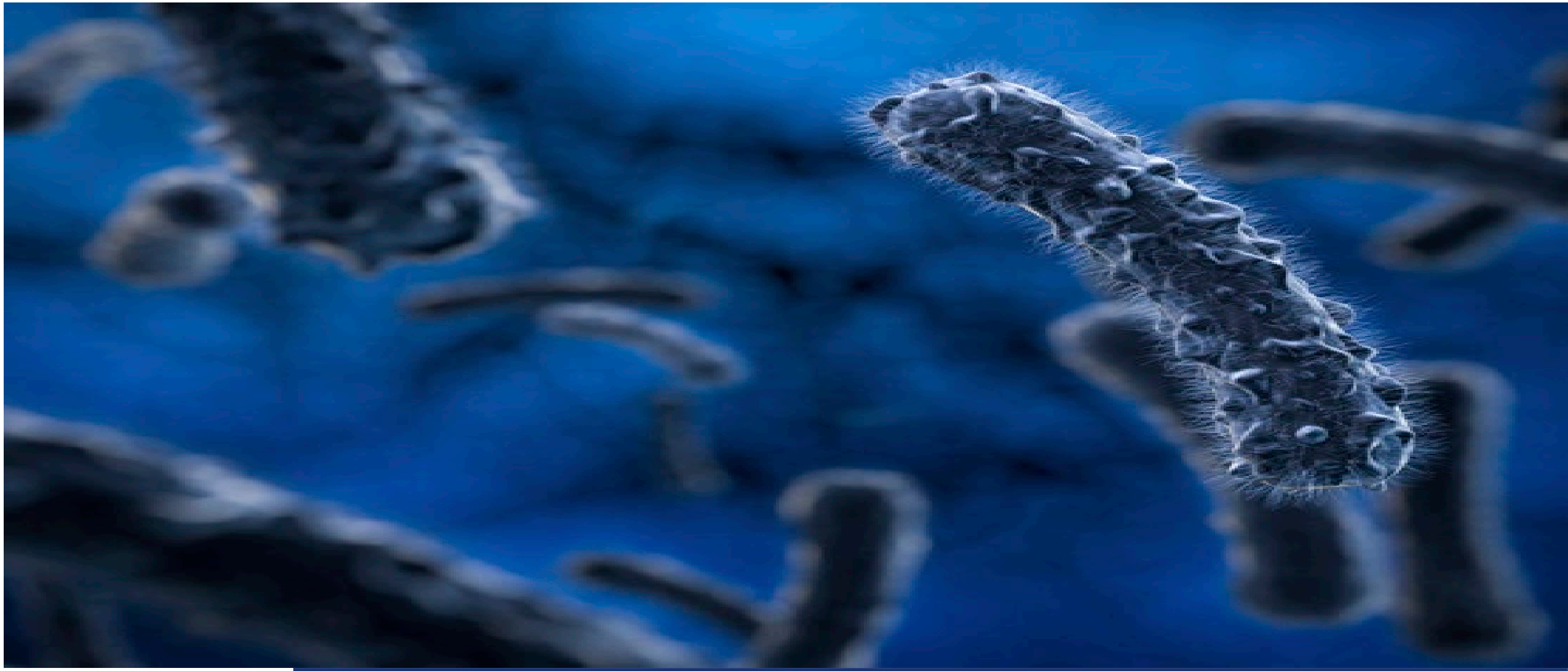
~ sinus and brain infections from inhalation

~ skin infections from settling on “broken” skin

~ infection in other parts of the body

~ *eyes, liver, bone, heart*

WHY



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WHY

WHY

- Reduces the risk of Healthcare-Associated Infections (HAIs)
- Improves patient safety and patient outcomes
- Protects healthcare workers from occupational infections related to construction
- Ensures compliance with regulations and standards

WHAT

The ICRA process is crucial for ensuring patient safety during any construction, renovation, or maintenance activities.

HOW

By identifying the construction project type and the vulnerability of patients in the area, the appropriate infection control precautions can be put in place..

WHO

- **The Construction Manager**
  - Project Management
  - Field Staff
  - Safety Department
  - Engineering Department
- **Subcontractors**

- **The Owner***
  - Project Management
  - Facilities
  - Safety
  - Infection Control
  - Nurse Manager
- **Architect/Design Team**

What is ICRA?

- A systematic process to identify and evaluate infection risks associated with activities within healthcare settings.
- Helps determine the level of risk to patients, staff, and visitors.
- Guides the implementation of control measures to minimize or eliminate risks.

Basically, ICRA is a hazard analysis

Public Relations

There are many well documented exposure scenarios!

"We failed': Seattle Children's CEO admits 6 deaths, more illnesses due to mold in Ors"

The Seattle Times, Nov. 18, 2019 at 11:38 am Updated Nov. 19, 2019 at 11:31 pm

The Courier-Journal

Monday, March 22, 1999 LOCAL NEWS

Hospital still faces fungus-death suits

By DICK KAUKAS, The Courier-Journal

Jewish Hospital did little to prevent vulnerable patients from being exposed to a deadly airborne fungus that may have been kicked up by construction in late 1994 and part of 1995, according to pretrial testimony in lawsuits filed against the hospital.

Court records show that at least four of the 14 cases against Jewish have been settled under undisclosed terms.

All of the suits are based on claims that patients died or were harmed by exposure to the aspergillus fungus while they were being treated at the hospital in 1995 and 1996 -- an assertion that Jewish, an organ transplant center, has denied in its answers to the complaints.

At least nine of the patients have died, either at the hospital or afterward, according to court documents.

Healthcare Terms

- **ICRA** – Infection Control Risk Assessment
- **ILSM** – Interim Life Safety Measures
- **PCRA** – Pre-construction ICRA and ILSM
- **JC** - Joint Commission
- **DOH**- Department of Health
- **Terminal Cleaning** – Detail cleaning of entire room

Healthcare Terms

- **Ambulatory v. Non-Ambulatory** – the ability to perform self rescue based on setting
- **Out Patient** – a facility that one arrives and leaves from treatment
- **Pre-Operative/PACU**
- **ICU** – Intensive Care unit (BICU, NICU, SICU etc.
- **Central Supply** – materials management
- **Nurse Manager/Charge Nurse**

Proponents of ICRA

Centers For Medicare and Medicaid Services (CMS)

Third- Party accrediting certifying organizations

- JC most well known

Centers for Disease Control and Prevention

- Guidelines for Environmental Infection control in Healthcare Settings (2003)

Facilities Guidelines Institute FGI – Guidelines for Design and Construction of Hospitals (2022)

Some <u>insurance</u> driven factors too!

Joint Commission

The Joint Commission has significantly updated the Environment of Care (EC) and Life Safety (LS) standards!

They are now combined into the “Physical Environment (PE)” chapter, effective in 2025.

Risk Management

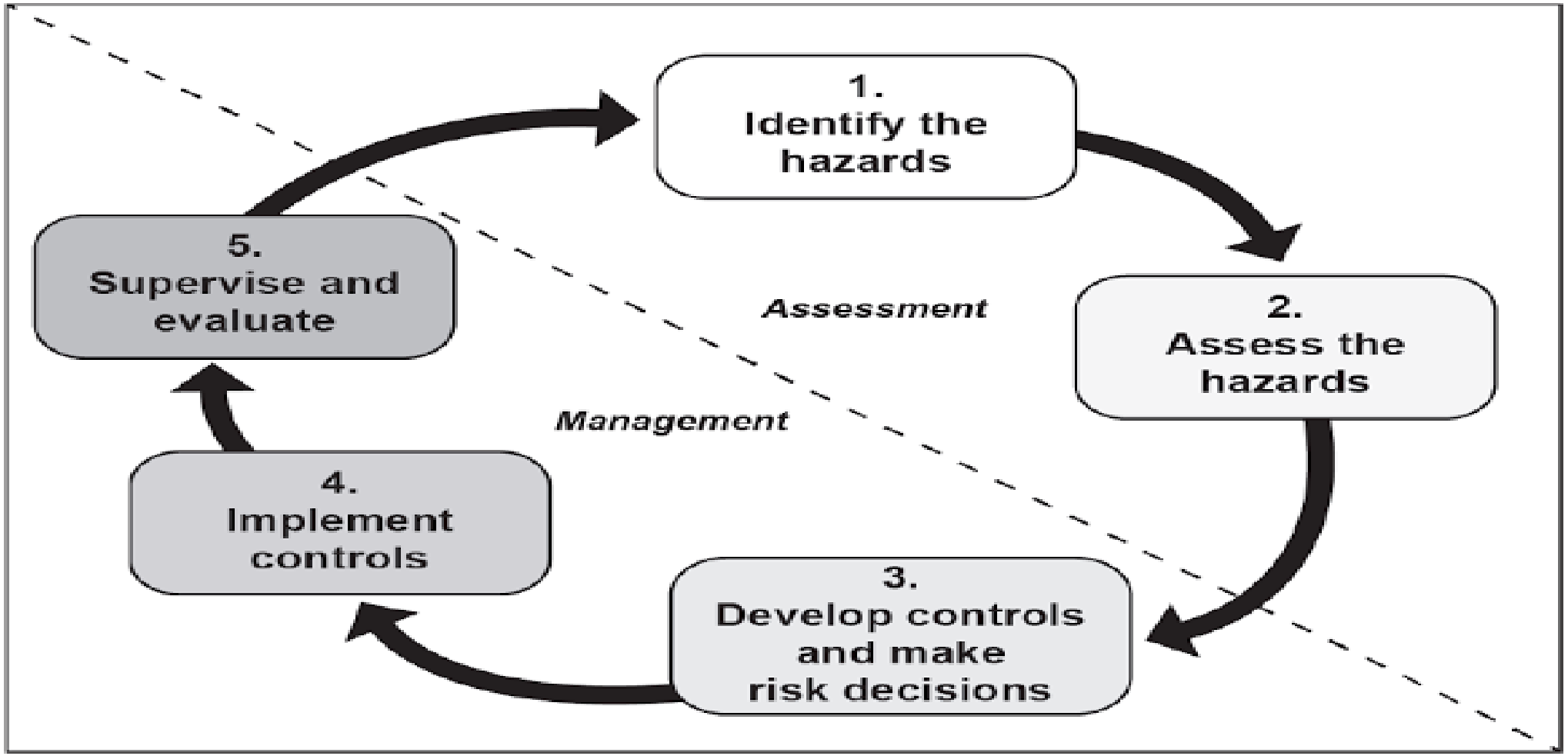
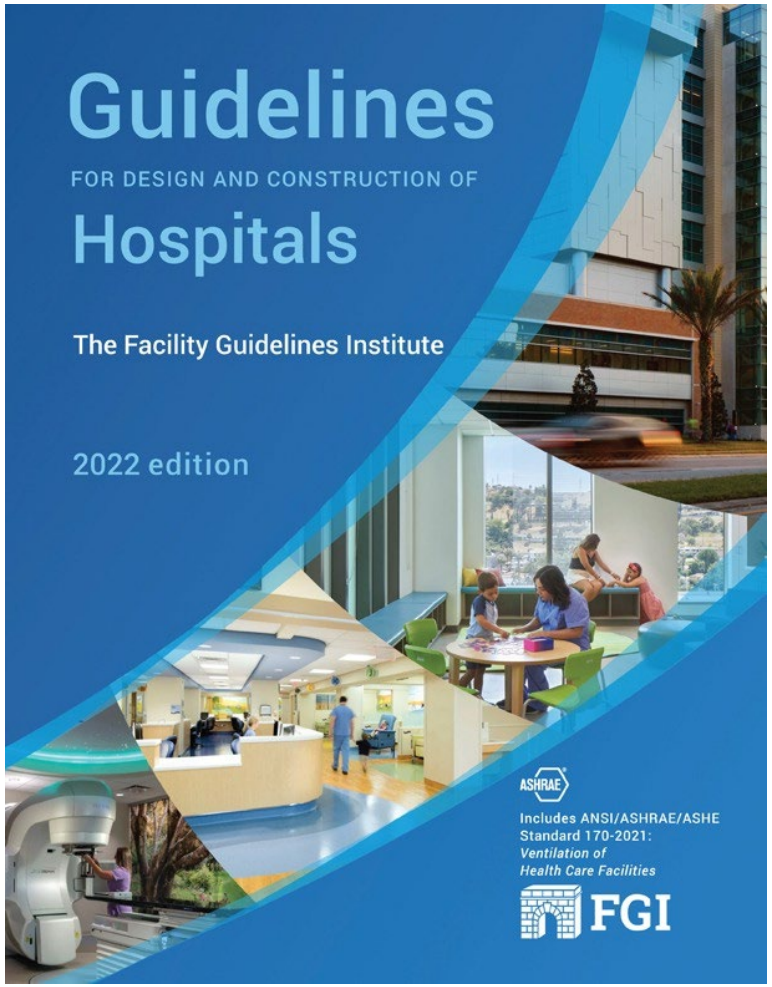


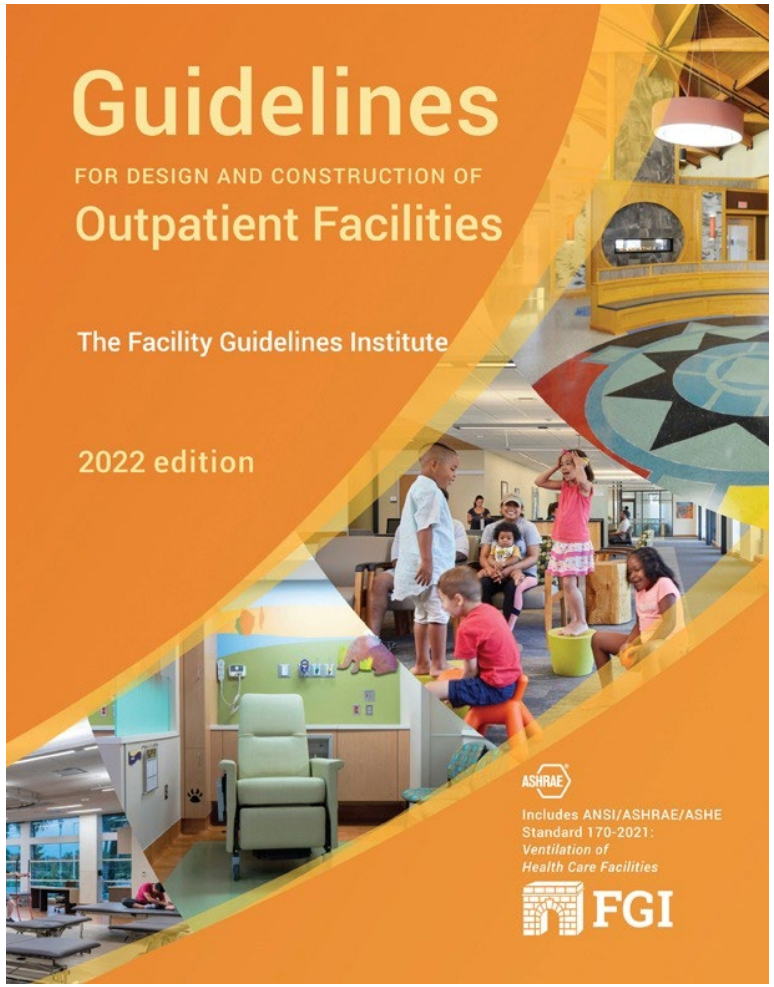
Figure 1-2. Assessment steps and management steps

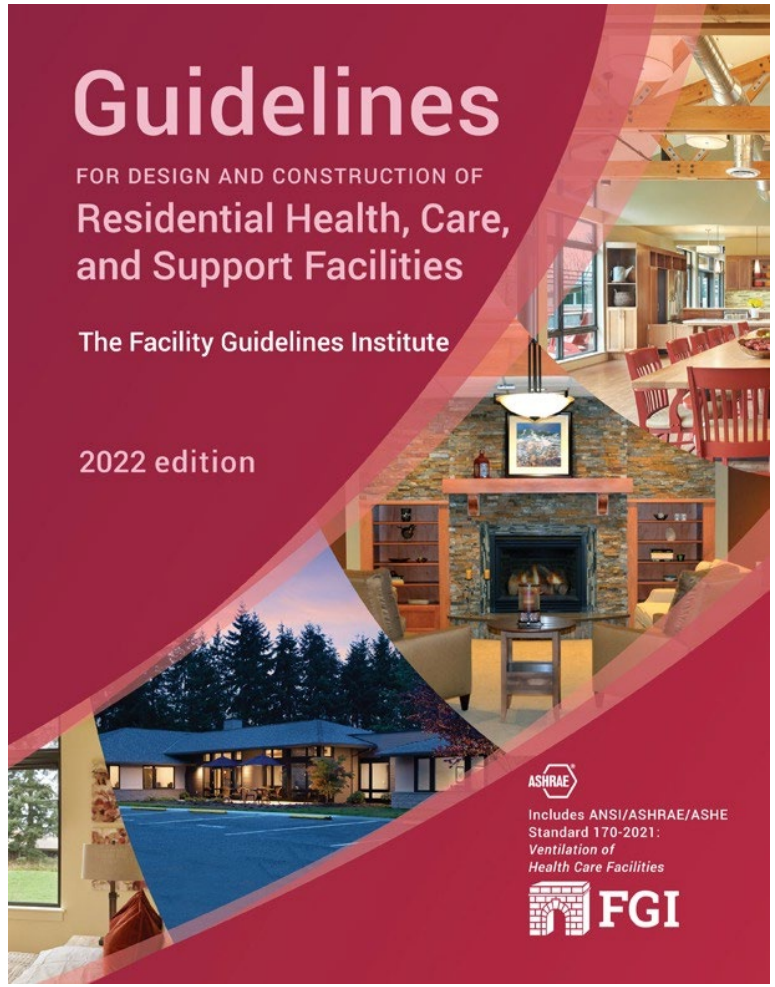
ICRA - Key Components

- **Identify Potential Hazards**
  Who, How, What, Where & When
- **Assess the Risk(s)**
  Multilateral approach
- **Select & Implement Controls**
  Develop “the plan”
- **Evaluate, Monitor and Verify**
  IPs, Rounding, OSH and GC

Identify Type of Facility







Identify Potential Hazards

- Infectious agents - bacteria, viruses, fungi
- Sources of infection - contaminated surfaces, equipment and/or people
- Modes of transmission - airborne, contact, droplet
- Susceptible individuals - patients with weakened immune systems, elderly, children

Identify Risks

- Scope of work
- Means and methods
- Schedule(s) of work
- Construction materials management
- Contractor & Subcontractor qualifications

Assess the Risk(s)

- Likelihood of exposure to the hazard
- Severity of potential infection
- Factors that may increase risk (e.g., invasive procedures, overcrowding)

Assess the Risk(s)

- Scope(s) of work – highest risk activities
- Means and methods – greatest dust generation/distribution
- Schedule(s) of work – day shift etc.
- Construction materials management – 5Ws
- Contractor & Subcontractor qualifications – have they done this type work in similar environments?

Select & Implement Controls

- **Elimination!!!!**
- Engineering controls (e.g., ventilation systems, isolation rooms)
- Administrative controls (e.g., policies, procedures, training)
- Personal protective equipment (PPE) (e.g., gloves, masks, gowns)

Contractor must create a work plan!!!

ICRA Matrix - 4 Primary Steps

Step 1 - ID type of construction (A,B,C or D)

Step 2 - ID patient risk group (Low, Medium, High or Highest

Step 3 - Match Patient Risk Group to Project Type and determine the Class of Precautions (matrix)

Step 4 - ID surrounding areas & potential impact by activities (start process over if needed)

ICRA Matrix

Infection Control Construction Permit

Permit No:

Location of Construction:	Project Start Date:
Project Coordinator:	Estimated Duration:
Contractor Performing Work	Permit Expiration Date:
Supervisor:	Telephone:

YES	NO	CONSTRUCTION ACTIVITY	YES	NO	INFECTION CONTROL RISK GROUP
		TYPE A: Inspection, non-invasive activity			GROUP 1: Low Risk
		TYPE B: Small scale, short duration, moderate to high levels			GROUP 2: Medium Risk
		TYPE C: Activity generates moderate to high levels of dust, requires greater 1 work shift for completion			GROUP 3: Medium/High Risk
		TYPE D: Major duration and construction activities Requiring consecutive work shifts			GROUP 4: Highest Risk

CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace any ceiling tile displaced for visual inspection.	3. Minor Demolition for Remodeling
CLASS II	1. Provides active means to prevent air-borne dust from dispersing into atmosphere 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Wipe surfaces with disinfectant.	6. Contain construction waste before transport in tightly covered containers. 7. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 8. Place dust mat at entrance and exit of work area. 9. Remove or isolate HVAC system in areas where work is being performed.
CLASS III Date Initial	1. Obtain infection control permit before construction begins. 2. Isolate HVAC system in area where work is being done to prevent contamination of the duct system. 3. Complete all critical barriers or implement control cube method before construction begins. 4. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 5. Do not remove barriers from work area until complete project is thoroughly cleaned by Env. Services Dept.	6. Vacuum work with HEPA filtered vacuums. 7. Wet mop with disinfectant 8. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 9. Contain construction waste before transport in tightly covered containers. 10. Cover transport receptacles or carts. Tape covering. 11. Remove or isolate HVAC system in areas where work is being performed/
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Additional Requirements:

Date Initials	Exceptions/Additions to this permit Date Initials are noted by attached memoranda
Permit Request By:	Permit Authorized By:
Date:	Date:

Step One:
Using the following table, *identify* the Type of Construction Project Activity (Type A-D)

TYPE A	**Inspection and Non-Invasive 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) ▪ wall covering, electrical trim work, minor plumbing, and activities which do not generate dust or require cutting of 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 of walls or ceiling where dust migration can be controlled.
TYPE C	**Work that generates a moderate to high level of dust or requires demolition or removal of any fixed building components or assemblies** Includes, but is not limited to: ▪ sanding of walls for painting or wall covering ▪ removal of floor coverings, ceiling tiles and casework ▪ new wall construction ▪ minor duct work or electrical work above ceilings ▪ major cabling activities ▪ any activity which cannot be completed within a single workshift.
TYPE D	**Major demolition and construction projects** Includes, but is not limited to: ▪ activities which require consecutive work shifts ▪ requires heavy demolition or removal of a complete cabling system ▪ new construction.

Step 1

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Step 2

Step Two:
Using the following table, ***identify*** **the Patient Risk Groups** that will be affected.
If more than one risk group will be affected, select the higher risk group:

Low Risk	Medium Risk	High Risk	Highest Risk
▪ Office areas	▪ Cardiology ▪ Echocardiography ▪ Endoscopy ▪ Nuclear Medicine ▪ Physical Therapy ▪ Radiology/MRI ▪ Respiratory Therapy	▪ CCU ▪ Emergency Room ▪ Labor & Delivery ▪ Laboratories (specimen) ▪ Newborn Nursery ▪ Outpatient Surgery ▪ Pediatrics ▪ Pharmacy ▪ Post Anesthesia Care Unit ▪ Surgical Units	▪ Any area caring for immunocompromised patients ▪ Burn Unit ▪ Cardiac Cath Lab ▪ Central Sterile Supply ▪ Intensive Care Units ▪ Medical Unit ▪ Negative pressure isolation rooms ▪ Oncology ▪ Operating rooms including C-section rooms

Step 2_____

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Step 2_____

Step 3

Step Three: Match the

Patient Risk Group (***Low, Medium, High, Highest***) with the planned …
Construction Project Type (***A, B, C, D***) on the following matrix, to find the …
Class of Precautions (***I, II, III or IV***) or level of infection control activities required.

Class I-IV or Color-Coded Precautions are delineated on the following page.

IC Matrix - Class of Precautions: Construction Project by Patient Risk

	Construction Project Type			
Patient Risk Group	**TYPE A**	**TYPE B**	**TYPE C**	**TYPE D**
LOW Risk Group	I	II	II	III/IV
MEDIUM Risk Group	I	II	III	IV
HIGH Risk Group	I	II	III/IV	IV
HIGHEST Risk Group	II	III/IV	III/IV	IV

Note: Infection Control approval will be required when the Construction Activity and Risk Level indicate that **Class III** or **Class IV** control procedures are necessary.

ICRA Matrix - Class of Precautions (I-IV)

Patient Risk Group	TYPE A	TYPE B	TYPE C	TYPE D
LOW Risk Group	I	II	II	III/IV
MEDIUM Risk Group	I	II	III	IV
HIGH Risk Group	I	II	III/IV	IV
HIGHEST Risk Group	II	III/IV	III/IV	IV

Step 3

Description of Required Infection Control Precautions by Class

	During Construction Project	Upon Completion of Project
CLASS I	1. Execute work by methods to minimize raising dust from construction operations. 2. Immediately replace a ceiling tile displaced for visual inspection	1. Clean work area upon completion of task.
CLASS II	1. Provide active means to prevent airborne dust from dispersing into atmosphere. 2. Water mist work surfaces to control dust while cutting. 3. Seal unused doors with duct tape. 4. Block off and seal air vents. 5. Place dust mat at entrance and exit of work area 6. Remove or isolate HVAC system in areas where work is being performed.	1. Wipe work surfaces with disinfectant. 2. Contain construction waste before transport in tightly covered containers. 3. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area. 4. Remove isolation of HVAC system in areas where work is being performed.
CLASS III	1. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system. 2. Complete all critical barriers i.e. sheetrock, plywood, plastic, to seal area from non work area or implement control cube method (cart with plastic covering and sealed connection to work site with HEPA vacuum for vacuuming prior to exit) before construction begins. 3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units. 4. Contain construction waste before transport in tightly covered containers. 5. Cover transport receptacles or carts. Tape covering unless solid lid.	1. Do not remove barriers from work area until completed project is inspected by the owner's Safety Department and Infection Control Department and thoroughly cleaned by the owner's Environmental Services Department. 2. Remove barrier materials carefully to minimize spreading of dirt and debris associated with construction. 3. Vacuum work area with HEPA filtered vacuums. 4. Wet mop area with disinfectant. 5. Remove isolation of HVAC system in areas where work is being performed.
CLASS IV	1. Isolate HVAC system in area where work is	1. Remove barrier material carefully to minimize

Step 3

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ICRA Matrix

Sub Steps in Step 3

- **Step 5** - ID exact areas site specific activities (patient rooms, med rooms etc.)
- **Step 6** - ID issues w/ MEP, med gas etc.
- **Step 7** - ID containment measures (hard barriers, HEPA filtration)
- **Step 8** - Assess risks to water and/or structural components
- **Step 9** - Work hours (during patient care or off hours)

ICRA Matrix

Sub Steps in Step 3

- **Step 10** - Work plan have adequate ventilation/isolation
- **Step 11** - Work plan provide adequate handwashing stations in patient care areas?
- **Step 12** – Do IPs agree with #11 above?
- **Step 13** - Do IPs concur with clean & soiled utility rooms?
- **Step 14** - Team discussion of: *traffic flow, housekeeping, debris removal, times of each etc.*

Contractor Expectations

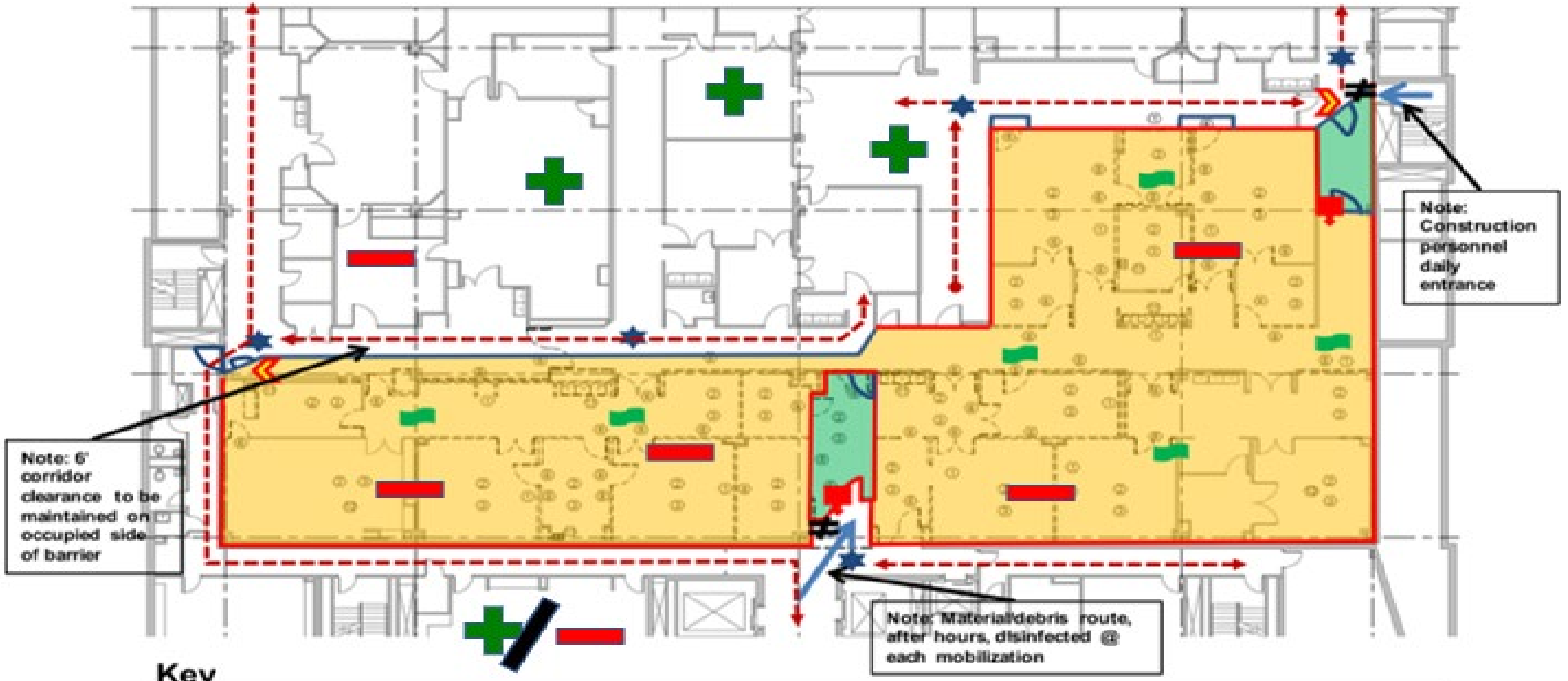
- **Airflow** - clean to dirty?
- **Dust** - control mats, HEPA vac?
- **Barriers** - intact?
- **Cleanliness** – frequent and regular
- **Adjacent Areas** – no holes?
- **Inspections** – throughout shift?
- **Staff** – trained in ICRA?
- **Water intrusion**- readings?
- **Mold** – visible/testing?
- **Filtration** – maintain filters?
- **NAMs** - working properly?
- **Schedule** – maintained?
- **Complaints or unresolved issues**?

GC's Work Plan

The General contractor shall prepare a Work Plan for all scopes of work to include phases and schedules.

The work plan shall include:

- Prework activities – location of utilizes, MEP etc.
- Training/competency of GC staff and subcontractors
- Temporary containments and controls to erect the ICRA containment
- Verification of adequate controls
- Disassembly of temporary controls.
- Housekeeping and inspection schedule
- Acceptance by owner of finished work product/areas


Note: 6' corridor clearance to be maintained on occupied side of barrier
Note: Construction personnel daily entrance
Note: Material/debris route, after hours, disinfected @ each mobilization
Key
Staff Traffic Flow
Temp Barrier
Existing Wall as Barrier
Project Area
Anteroom
Construction Entrance
Exhaust for Negative Pressure
Emergency Egress Only
Manometer Location
Laser Particle Count Location
HEPA PAS Recirculating (@ 2,000 CFM)

Preconstruction Meeting

Once the General Contractor's Work Plan has been accepted the ENTIRE ICRA Team shall meet to review the plan and work out any issues prior to beginning work!

ICRA Issues

- ICRA is a continuing process
- Once a plan is developed, implement it!
- Document the process
- Facility owner ultimately is responsible for conducting an ICRA plan and implementing recommendations
- Design implementation is the responsibility of the Architect/Design Team
- Means and methods are the responsibility of the contractor

ILSM Questions

- Will access to emergency services and for emergency responders be impaired, restricted, or rerouted?
- Will any fire detection or alarm systems be impaired?
- Will any part of the fire suppression or sprinkler system be impaired?
- Will any smoke/firewalls, doors, or assemblies be compromised?
- Will the fire safety (EXITs) of personnel in adjacent areas be affected?
- Will it be necessary to install temporary construction partitions? Smoke Tight/Fire Rated
- Will the project result in the accumulation of debris and/or materials and increase the combustible load in the work area?
- Will the project activity include significant ignition sources (e.g. cutting, welding, soldering, or other activities involving an open flame)?
- Will the project activity present any other safety-related hazards?

Questions?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SIGNATURE SAFETY

6 10:15AM


REHAB MEDICINE
WILLIAM ERDMAN OUTPATIENT CENTER
Pardon our Appearance
while we give our area a "New Look."
DANGER !!
CONSTRUCTION AREA
KEEP OUT!


Children's Hospital of Philadelphia
Contact List
DANGER
CONSTRUCTION AREA
NO ACCESS
NO EXIT
WEAR HATS AND EYE
PROTECTION REQUIRED
BEYOND THIS POINT
KEEP DOORS CLOSED
ILS PLAN
DAILY CHECKLIST
HOT WORK
Authorized Personnel Only
Solo Personal Autorizado


KNAACK
LFD


EXIT


EXIT
OR
CONSTRUCTION
AREA
4
AEROSPACE
AMERICA
1-800-237-6414


1 HOUR
SMOKE BARRIER
ANTI ROOM
DEWALT
S K

SIGNATURE SAFETY


EMERGENCY
EXIT ONLY


EasyGard


EXIT


READ AND UNDERSTAND THE OPERATING MANUAL
BEFORE USING EQUIPMENT. UNIT SHOULD BE
OPERATED BY TRAINED PERSONNEL.
IF CONNECTED TO A CIRCUIT PROTECTED BY FUSES
USE TIME DELAY FUSES MARKED "D"
FILTER
CHANGE
INDICATOR
MOTOR SPEED
CIRCUIT
BREAKER
OFF
ON

Questions?