



Ensuring Safety Through Construction and Renovation – Infection Control Risk Assessments

Kacey Beck, BSN, RN | Sept. 24 and 25, 2024

Presenter



Kacey Beck, BSN, RN
Infection Preventionist
Kacey.Beck@ks.gov

What is an ICRA?

ICRA is Infection Control Risk Assessment

Definition: Proactive, formal, documented approach to identifying infection prevention and control (IPC) risks related to construction and renovation activities

Goal: Protect those within the healthcare organization

Facility policy should include:

- Department responsibilities
- Projects/types of work requiring an ICRA
- Processes for confirming compliance
- Recordkeeping requirements
- Authority clearly outlined for Infection Preventionist (IP)



Regulations and Standards

Joint Commission – EC.02.06.05 requires the organization to have a pre-construction risk assessment process in place, ready to be applied at any time if planned or unplanned demolition, construction or renovation occurs.

Centers for Medicare and Medicaid Services (CMS) – The hospital has infection control policies and procedures relevant to construction, renovation, maintenance, demolition, and repair, including the requirement for an infection control risk assessment (ICRA) to define the scope of the project and need for barrier measures before a project gets underway.

Occupational Safety and Health Administration (OSHA) – Employers must keep the workplace free of known hazards.

Communication and Coordination

ICRA multidisciplinary taskforce:

- IPs
- Maintenance
- Environmental Services
- Facility leadership/administration
- Risk/Quality
- Frontline workers
- Architects/Engineers/Project foreman (if applicable)

ICRA Scenario

- You are an IP in a healthcare facility that is planning to renovate and upgrade an existing patient unit.
- The renovation includes demolition of walls, installation of new plumbing, electrical systems, and expansion of patient rooms.
- The project will last for approximately six months.
- Construction will take place on an occupied patient unit that's located adjacent to the kitchen/dining area, central supply, and administrative offices.

Risk Assessment Process Overview

Step 1) Identify type of construction

 Infection Control Risk Assessment 2.0 Matrix of Precautions for Construction, Renovation and Operations	
Step One: Using Table 1, Identify the Activity Type (A-D).	
Table 1 - Activity Type: 	
Type A	Inspection and non-invasive activities. Includes but is not limited to: • Removal of ceiling tile for visual inspection-limited to 1 tile per 50 square feet with limited exposure time. • Limited building system maintenance (e.g., pneumatic tube station, HVAC system, fire suppression system, electrical and carpentry work to include painting without sanding) that does not create dust or debris. • Clean plumbing activity limited in nature.
Type B	Small-scale, short duration activities that create minimal dust and debris. Includes but is not limited to: • Work conducted above the ceiling (e.g., prolonged inspection or repair of firewalls and barriers, installation of conduit and/or cabling, and access to mechanical and/or electrical chase spaces). • Fan shutdown/startup. • Installation of electrical devices or new flooring that produces minimal dust and debris. • The removal of drywall where minimal dust and debris is created. • Controlled sanding activities (e.g., wet or dry sanding) that produce minimal dust and debris.
Type C	Large-scale, longer duration activities that create a moderate amount of dust and debris. Includes but is not limited to: • Removal of preexisting floor covering, walls, casework or other building components. • New drywall placement. • Renovation work in a single room. • Non-existing cable pathway or invasive electrical work above ceilings. • The removal of drywall where a moderate amount of dust and debris is created. • Dry sanding where a moderate amount of dust and debris is created. • Work creating significant vibration and/or noise. • Any activity that cannot be completed in a single work shift.
Type D	Major demolition and construction activities. Includes but is not limited to: • Removal or replacement of building system component(s). • Removal/installation of drywall partitions. • Invasive large-scale new building construction. • Renovation work in two or more rooms.

Risk Assessment Process Overview

Step 2) Identify the patient/resident or staff group affected

Step 3) Determine the level of infection control classification

ASHE
Advancing Health Care Facilities

Infection Control Risk Assessment 2.0

Matrix of Precautions for Construction, Renovation and Operations

Step Two:
Using Table 2, identify the Patient Risk Group(s) that will be affected. If more than one risk group will be affected, select the higher risk group.

Table 2 - Patient Risk Group: High Risk

Low Risk	Medium Risk	High Risk	Highest Risk
Non-patient care areas such as:	Patient care support areas such as:	Patient care areas such as:	Procedural, invasive, sterile support and highly compromised patient care areas such as:
- Public hallways and gathering areas not on clinical units. - Office areas not on clinical units. - Breakrooms not on clinical units. - Bathrooms or locker rooms not on clinical units. - Mechanical rooms not on clinical units. - EVS closets not on clinical units.	- Waiting areas. - Clinical engineering. - Materials management. - Sterile processing department - dirty side. - Kitchen, cafeteria, gift shop, coffee shop, and food kiosks.	- Patient care rooms and areas. - All acute care units. - Emergency department. - Employee health. - Pharmacy - general work zone. - Medication rooms and clean utility rooms. - Imaging suites: diagnostic imaging. - Laboratory.	- All transplant and intensive care units. - All oncology units. - OR theaters and restricted areas. - Procedural suites. - Pharmacy compounding. - Sterile processing department - clean side. - Transfusion services. - Dedicated isolation wards/units. - Imaging suites: invasive imaging.

Step Three:
Match the Patient Risk Group (Low, Medium, High, Highest) from Step Two with the planned Construction Activity Project Type (A, B, C, D) from Step One using Table 3 to find the Class of Precautions (I, II, III, IV or V) or level of infection control activities required. The activities are listed in Table 5 – Minimum Required Infection Control Precautions by Class.

Table 3 - Class of Precautions: V

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

Infection control and environmental approval will be required when Class of Precautions III (Type C) and all Class of Precautions IV or V are necessary.

Environmental conditions that could affect human health, such as sewage, mold, asbestos, gray water and black water will require Class of Precautions IV for LOW and MEDIUM Risk Groups and Class of Precautions V for HIGH and HIGHEST Risk Groups.

*Type C [Medium Risk groups] and Type D [Low Risk Groups] work areas [Class III precautions] that cannot be sealed and completely isolated from occupied patient care spaces should be elevated to include negative air exhaust requirements as listed in Class IV Precautions.

©2022 American Society for Health Care Engineering of the American Hospital Association

Risk Assessment Process Overview

Step 4) Consider the surrounding area
Example on next slide

**Infection Control Risk Assessment 2.0**
Matrix of Precautions for Construction, Renovation and Operations

Step Four:
Assess potential risk to areas surrounding the project. Using Table 4, identify the surrounding areas that will be affected and the type of impact that will occur. If more than one risk group will be affected, select the higher risk group using Table 2 - Patient Risk Group.

Table 4 - Surrounding Area Assessment

Unit Below:	Unit Above:	Unit Lateral:	Unit Behind:	Unit in Front:
Risk Group:	Risk Group:	Risk Group:	Risk Group:	Risk Group:
Contact:	Contact:	Contact:	Contact:	Contact:
Phone:	Phone:	Phone:	Phone:	Phone:
Additional Controls: ☐ Noise ☐ Vibration ☐ Dust control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevators/Stairs	Additional Controls: ☐ Noise ☐ Vibration ☐ Dust control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevators/Stairs	Additional Controls: ☐ Noise ☐ Vibration ☐ Dust control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevators/Stairs	Additional Controls: ☐ Noise ☐ Vibration ☐ Dust control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevators/Stairs	Additional Controls: ☐ Noise ☐ Vibration ☐ Dust control ☐ Ventilation ☐ Pressurization ☐ Vertical Shafts ☐ Elevators/Stairs
Systems impacted: ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	Systems impacted: ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	Systems impacted: ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	Systems impacted: ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water	Systems impacted: ☐ Data ☐ Mechanical ☐ Med Gases ☐ Hot/Cold Water
Noise & Vibration Mitigation Strategies ☐ Use diamond drills instead of powder-actuated fasteners. ☐ Schedule noise-making periods with adjacent spaces. ☐ Use beam clamps instead of shot. ☐ Prefab where possible. ☐ Use tin snips to cut metal studs instead of using a chop saw. ☐ Install metal decking with vent tabs, then use cellular floor deck hangers. ☐ Consider compression style fittings instead of soldering, brazing or welding. ☐ Wet core drill instead of dry core or percussion. ☐ Instead of jackhammering concrete, use wet diamond saws. ☐ Use HEPA vacuums instead of standard wet/dry vacuums. ☐ Use mechanical joining system sprinkler fittings instead of threaded. ☐ Where fumes are tolerated, use chemical adhesive remover (flooring glue) instead of mechanical. ☐ To remove flooring, consider abrasive blasting instead of using a floor scraper. ☐ Use electric sheers instead of reciprocating saw for ductwork cutting. ☐ Install exterior man/material lifts.				
Ventilation & Pressurization Mitigation Strategies ☐ HEPA to exterior. ☐ Install temporary ductwork. ☐ Utilize temporary HVAC equipment. ☐ Vacate the area. ☐ Install temporary partitions. ☐ Use carbon filtration to filter odors.				
Impact to Other Systems Mitigation Strategies ☐ Schedule outages. ☐ Provide temporary systems. ☐ Back-feed electricity or medical gases.				

©2022 American Society for Health Care Engineering of the American Hospital Association

ashe.org/system/files/media/file/2022/08/ICRA%202.0%20Tool%20%2B%20Permit.pdf

To protect and improve the health and environment of all Kansans

Risk Assessment Process Overview

Step 4) Consider the surrounding area

Unit Below: Laundry	Unit Above: N/A	Unit Lateral: Admin Offices	Unit Behind: Central Supply	Unit in Front: Dining
Risk Group: Medium	Risk Group: N/A	Risk Group: Low	Risk Group: Medium	Risk Group: Medium

Additional Controls

- Noise
- Vibration
- Dust Control
- Ventilation
- Pressurization

Systems impacted

- Medical gases
- Hot/cold water
- Data

Strategies

Noise and Vibration

- Schedule noise-making periods
- Prefab when possible
- Discuss additional options with project foreman

Ventilation

- HEPA filtration
- Temporary ductwork
- Partitions

Other Systems

- Schedule outages
- Provide temporary systems
- Portable medical gases

Risk Assessment Process Overview

Step 5) Identify minimum
required IPC precautions by
class (matrix)

 Infection Control Risk Assessment 2.0 Matrix of Precautions for Construction, Renovation and Operations	
Table 5 - Minimum Required Infection Control Precautions During Work Activity	
Class of Precautions	Mitigation Activities (Performed Before and During Work Activity)
Class I	1. Perform noninvasive work activity as to not block 2. Perform noninvasive work activities in areas that 3. Perform noninvasive work activity in a manner that 4. Immediately replace any displaced ceiling tile before work activity.
Class II	1. Perform only limited dust work and/or activities d 2. Perform limited dust and invasive work following organization. 3. This Class of Precautions must never be used for
Class III	1. Provide active means to prevent airborne dust di 2. Means for controlling minimal dust dispersion ma 3. Remove or isolate return air diffusers to avoid du 4. Remove or isolate the supply air diffusers to avoi 5. If work area is contained, then it must be neutral 6. Seal all doors with tape that will not leave residue 7. Contain trash and debris in the work area. 8. Nonporous/smooth and cleanable containers (wit 9. Install an adhesive (dust collection) mat at entranc 10. Maintain clean surroundings when area is not co
Class IV	1. Construct and complete critical barriers meeting 2. All (plastic or hard) barrier construction activities 3. Seal all penetrations in containment barriers, incl 4. Containment units or environmental containment 5. Remove or isolate return air diffusers to avoid du 6. Negative airflow pattern must be maintained from 7. Maintain negative pressurization of the entire wo 8. Exhaust discharged directly to the outdoors that re 9. If exhaust is directed indoors, then the system m 10. Exhaust into shared or recirculating HVAC system 11. Install device on exterior of work containment to 12. Contain all trash and debris in the work area.
Class V	13. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. 14. Worker clothing must be clean and free of visible dust before leaving the work area. HEPA vacuuming of clothing or use of cover suits is acceptable. 15. Workers must wear shoe covers prior to entry into the work area. Shoe covers must be changed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be immediately changed. 16. Install an adhesive (dust collection) mat at entrance of contained work area based on facility policy. Adhesive mats must be changed routinely and when visibly soiled. 17. Consider collection of particulate data during work to monitor and ensure that contaminants do not enter the occupied spaces. Routine collection of particulate samples may be used to verify HEPA filtration efficiencies. 1. Construct and complete critical barriers meeting NFPA 241 requirements including: Barriers must extend to the ceiling, or if ceiling tile is removed, to the deck above, and all penetrations through the barrier shall meet the appropriate fire rating requirements. 2. All (plastic or hard) barrier construction activities must be completed in a manner that prevents dust release. Plastic barriers must be effectively affixed to ground and ceiling and secure from movement or damage. Apply tape that will not leave a residue to seal gaps between barriers, ceiling or floor. 3. Seal all penetrations in containment barriers, anteroom barriers, including floors and ceiling using approved materials (UL schedule firestop if applicable for barrier type). 4. Construct anteroom large enough for equipment staging, cart cleaning, workers. The anteroom must be constructed adjacent to entrance of construction work area. 5. Personnel will be required to wear disposable coveralls at all times during Class V work activities. Disposable coveralls must be removed before leaving the anteroom. 6. Remove or isolate return air diffusers to avoid dust entering the HVAC system. 7. Remove or isolate the supply air diffusers to avoid positive pressurization of the space. 8. Negative airflow pattern must be maintained from the entry point to the anteroom and into the construction area. The airflow must cascade from outside to inside the construction area. The entire construction area must remain negatively pressurized. 9. Maintain negative pressurization of the entire workspace using HEPA exhaust air systems directed outdoors. Exhaust discharged directly to the outdoors that is 25 feet or greater from entrances, air intakes and windows does not require HEPA-filtered air. 10. If exhaust is directed indoors, then the system must be HEPA filtered. Prior to start of work, HEPA filtration must be verified by particulate measurement as no less than 99.97% efficiency and must not alter or change airflow/pressure relationships in other areas. 11. Exhaust into shared or recirculating HVAC systems, or other shared exhaust systems (bathroom exhaust) is not acceptable. 12. Install device on exterior of work containment to continually monitor negative pressurization. To assure proper pressure is continuously maintained, it is recommended that the device(s) have a visual pressure indicator. 13. Contain all trash and debris in the work area. 14. Nonporous/smooth and cleanable containers (with a hard lid) must be used to transport trash and debris from the construction areas. These containers must be damp-wiped cleaned and free of visible dust/debris before leaving the contained work area. 15. Worker clothing must be clean and free of visible dust before leaving the work area anteroom. 16. Workers must wear shoe covers prior to entry into the work area. Shoe covers must be changed prior to exiting the anteroom to the occupied space (non-work area). Damaged shoe covers must be immediately changed. 17. Install an adhesive (dust collection) mat at entrance of contained work area based on facility policy. Adhesive mats must be changed routinely and when visibly soiled. 18. Consider collection of particulate data during work to monitor and ensure that contaminants do not enter the occupied spaces. Routine collection of particulate samples may be used to verify HEPA filtration efficiencies.

Risk Assessment Process Overview

Step 6) Monitor

Published in the APIC/JCR Infection Prevention and Control Workbook, 4th edition.
Joint Commission Resources, 2021
File name: 7.5 Construction and Renovation Infection Control Checklist

Published in *The APIC/JCR Infection Prevention and Control Workbook, 4th edition*
Joint Commission Resources, 2021.
File Name: 7.5 Construction and Renovation Infection Control Checklist

Construction and Renovation Infection Control Checklist

Project: _____

Reviewer: _____ Date: _____ Time: _____

	Yes	No	N/A	Comments
Are temporary construction barriers dust-tight?				
Are temporary hole penetrations in walls and ceilings covered adequately?				
Are ceiling tiles replaced at the end of shift if removed for access?				
Are doors kept closed or appropriately sealed?				
Has existing ductwork been covered or sealed?				
Is the outside construction area kept damp to minimize dust?				
Is a negative air machine running and exhausted to the outside of the building?				
Are containers to remove debris tightly covered and wiped down before leaving the construction area?				
Is signage appropriate to restrict and direct traffic around the area?				
Have walk-off or tack mats been provided and changed as needed to prevent accumulation of dust?				
Is the construction area regularly cleaned?				
Is dust tracked outside of construction barriers removed immediately?				
Is cleaning outside all construction barriers done with a method approved by the infection control coordinator, safety officer, or person responsible for infection control activities?				

Source: San Ramon Regional Medical Center, San Ramon, California. Used with permission.
© 2021 The Joint Commission. May be adapted for internal use.

Page 1 of 1

ICRA Permit

ICRA 2.0 Infection Control Risk Assessment and Permit							
ICRA 2.0 Infection Control Risk Assessment and Permit		Project Name: _____					
		ICRA Number: _____		Requested by: _____			
Location of Work Activity		Project Start Date					
Estimated Duration		Completion Date					
Foreman/Supervisor		Phone					
Contractor Performing Work		Phone					
Approving Authority		Phone					
Please note that the above signature is approval of the work activity as described and assessed documented here. Should the scope of work change or the discovery of additional toxic or biological substances. STOP WORK and seek additional approval and guidance before proceeding.							
1. Type of Activity			Explain this reasoning for this assessment				
☐ Type A: Non-invasive ☐ Type B: Small-scale, short duration ☐ Type C: Large-scale, longer duration ☐ Type D: Major demolition, construction							
2. Patient Risk Area			Describe key patient risks				
☐ Low: Non-patient care areas ☐ Medium: Patient care support areas ☐ High: Patient care areas ☐ Highest: Invasive, sterile or highly compromised care							
3. Class of Precautions							
	Type A		Type B		Type C		Type D
Low	☐ I		☐ II		☐ II		☐ III
Medium	☐ I		☐ II		☐ III		☐ IV
High	☐ I		☐ III		☐ IV		☐ V
Highest	☐ III		☐ IV		☐ V		☐ V
4. Surrounding Area							
	Below:	Above:	Lateral:	Behind:	In Front:		
Risk group							
Contact							
Phone							
Controls	☐ Noise ☐ Vibration ☐ Dust ☐ Ventilation ☐ Pressurization	☐ Noise ☐ Vibration ☐ Dust ☐ Ventilation ☐ Pressurization	☐ Noise ☐ Vibration ☐ Dust ☐ Ventilation ☐ Pressurization	☐ Noise ☐ Vibration ☐ Dust ☐ Ventilation ☐ Pressurization	☐ Noise ☐ Vibration ☐ Dust ☐ Ventilation ☐ Pressurization		
Systems impacted:	☐ Data ☐ Mechanical ☐ Med Gas ☐ Hot/Cold Water ☐ Other	☐ Data ☐ Mechanical ☐ Med Gas ☐ Hot/Cold Water ☐ Other	☐ Data ☐ Mechanical ☐ Med Gas ☐ Hot/Cold Water ☐ Other	☐ Data ☐ Mechanical ☐ Med Gas ☐ Hot/Cold Water ☐ Other	☐ Data ☐ Mechanical ☐ Med Gas ☐ Hot/Cold Water ☐ Other		
Were there discoveries in surrounding areas that would serve as cause to increase the class of precautions and necessitate additional controls? If so, please summarize.							

©2022. American Society for Health Care Engineering of the American Hospital Association

[illegible]

Infection control permits are required for class III, IV and V projects.

Post on all jobsite entrances.

Common Misses

- Construction projects identified throughout the facility. ICRA's not completed for these projects.
- Sheetrock exposed for extended period for a planned paint project.
- Improper handling of waste and debris.
- Delayed cleaning/disinfection.

References

- Association for Professionals in Infection Control and Epidemiology. (2019). *Infection prevention manual for construction & renovation* (eBook Rev. ed.). Association for Professionals in Infection Control and Epidemiology, Inc. (APIC). apic.org/Resource/store/books/preview/SLS9808_Preview.pdf
- The Health Research & Educational Trust of the American Hospital Association, American Society for Health Care Engineering, Association for Professionals in Infection Control and Epidemiology, Society of Hospital Medicine, and University of Michigan. (n.d.). *Quick guide, Chapter 1: Infection control risk assessments*. ashe.org/sites/default/files/ashe/AllQuickGuides.pdf
- Mohammed, T. (2023). From blueprints to ribbon cutting: Infection Preventionists' role in construction. 27(6), 18-20. infectioncontrolday.com/view/from-blueprints-to-ribbon-cutting-infection-preventionists-role-in-construction
- Booth, R., Kobus, C., Stever, R., Adams, T., Corso, J. F., & Upton, S. (2022). *Conducting infection control risk assessments the right way*. Health Facilities Management. hfm magazine.com/articles/4623-conducting-infection-control-risk-assessments-the-right-way
- Hepacart. (2024, January 15). Secrets of ICRA containment: The ultimate guide to mitigating risks. *Hepacart*. hepacart.com/blog/secrets-of-icra-containment-the-ultimate-guide-to-mitigating-risks#:~:text=Once%20the%20type%20of%20construction,medium%2C%20high%2C%20and%20highest

Healthcare-Associated Infections & Antimicrobial Resistance Section



Kacey Beck, BSN, RN

Infection Preventionist

Kacey.Beck@ks.gov

KDHE HAI/AR Section Contact Info:

Email: kdhe.HAIAR@ks.gov

Website: kdhe.ks.gov/1514/

24/7 KDHE Epidemiology Hotline

(877) 427-7317



Looking for more information
on Infection Prevention?

How can we help?

Thank You/Questions

