Infection Prevention and Construction
Bed Bug Management

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Objectives:

- Review ICRA and process to complete risk assessment prior to construction.
- Describe the infection prevention measures required during construction/renovation in a healthcare facility.
- Review examples of healthcare construction projects, Do’s and Don’ts.
- Identify processes for Bed Bug Management in Healthcare facilities.
Infection Control Risk Assessment (ICRA) is a plan created for all new construction and renovation projects. An ICRA plan protects patients, visitors, and staff from the risks associated with construction. Dust barriers are designed and built to contain dust and other airborne particles. Negative air pressure is the most important component of dust protection.
REGULATIONS AND DOCUMENTATION

ENTITIES AND REGULATIONS (BUT NOT LIMITED TO):

- THE JOINT COMMISSION
- CMS
- OSHA
- ADA (AMERICANS WITH DISABILITIES ACT)
- HIPAA (PATIENT PRIVACY ACT)
- SD, MN, IA Departments of Health
- State Fire Marshalls
- City Building Inspectors
- Local Fire Department (Local Authority)
In the healthcare setting, construction activities usually fall into one of the following categories:

- Minor repair and system replacements
- Major system upgrades
- Major additions
- Major area renovations
- Construction adjacent to the hospital
To ensure a safe project, develop a plan for each healthcare job site. Depending on the type of job some or all of these steps will be needed:

- Containment of the job site
- Entry and exit of workers from the job site
- Containment and transport of materials and debris
- Methods of decontaminating crews
- Monitoring of site by project officers, safety and/or infection control
- Cleanup of the job site
Infection Prevention Insight

- Dialysis water – design/plumbing/piping/water processing and installation specifications
- Protective Isolation ventilation design and specifications
- Sinks: locations, hand-washing stations
- OR ventilation design and specifications
- Special procedure room design and specifications
CONSTRUCTION ISSUES ENCOUNTERED IN A HOSPITAL ENVIRONMENT

- SITE SAFETY PRACTICES
- INFECTION CONTROL
- SITE CONTAINMENT & FILTRATION
- FIRE PROTECTION
- PATIENT CONFIDENTIALITY
- SECURITY
- REGULATIONS AND DOCUMENTATION
- STANDARDS OF BEHAVIOR
# Infection Control Risk Assessment

## Matrix of Precautions for Construction & Renovation

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

<table>
<thead>
<tr>
<th>TYPE</th>
<th>Description</th>
</tr>
</thead>
</table>
| **A** | Inspection and Non-Invasive Activities. Includes, but is not limited to:  
- removal of ceiling tiles for visual inspection only, e.g., limited to 1 tile per 50 square feet  
- painting (but not sanding)  
- wallcovering, 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. |
| **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. |
| **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 floorcoverings, 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. |
| **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. |
### Description of Required Infection Control Precautions by Class

<table>
<thead>
<tr>
<th>During Construction Project</th>
<th>Upon Completion of Project</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Execute work by methods to minimize raising dust from construction operations.</td>
<td>1. Clean work area upon completion of task.</td>
</tr>
<tr>
<td>- Immediately replace a ceiling tile displaced for visual inspection</td>
<td>2. Wipe work surfaces with cleaner/disinfectant.</td>
</tr>
<tr>
<td>1. Provide active means to prevent airborne dust from dispersing into atmosphere.</td>
<td>3. Contain construction waste before transport in tightly covered containers.</td>
</tr>
<tr>
<td>- Water must work surfaces to control dust while cutting.</td>
<td>4. Wet mop and/or vacuum with HEPA filtered vacuum before leaving work area.</td>
</tr>
<tr>
<td>- Seal unused doors with duct tape.</td>
<td>5. Upon completion, restore HVAC system where work was performed.</td>
</tr>
<tr>
<td>- Block off and seal air vents.</td>
<td>6. Do not remove barriers from work area until completed project is inspected by the owner’s Safety Department and Infection Prevention &amp; Control Department and thoroughly cleaned by the owner’s Environmental Services Department.</td>
</tr>
<tr>
<td>- Place dust mat at entrance and exit of work area</td>
<td>2. Remove barrier material carefully to minimize spreading of dirt and debris associated with construction.</td>
</tr>
<tr>
<td>6. Remove or isolate HVAC system in areas where work is being performed.</td>
<td>3. Vacuum work area with HEPA filtered vacuums.</td>
</tr>
<tr>
<td>1. Remove or Isolate HVAC system in area where work is being done to prevent contamination of duct system.</td>
<td>4. Wet mop area with cleaner/disinfectant.</td>
</tr>
<tr>
<td>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.</td>
<td>5. Upon completion, restore HVAC system where work was performed.</td>
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<tr>
<td>3. Maintain negative air pressure within work site utilizing HEPA equipped air filtration units.</td>
<td></td>
</tr>
<tr>
<td>5. Cover transport receptacles or carts. Tape covering unless solid lid.</td>
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<tr>
<td>4. Seal holes, pipes, conduits, and punctures.</td>
<td></td>
</tr>
<tr>
<td>5. Construct anteroom and require all personnel to pass through this room so they can be vacuumed using a HEPA vacuum cleaner before leaving work site or they can wear cloth or paper coveralls that are removed each time they leave work site.</td>
<td></td>
</tr>
<tr>
<td>6. All personnel entering work site are required to wear shoe covers. Shoe covers must be changed each time the worker exits the work area.</td>
<td></td>
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<td>7. Upon completion, restore HVAC system where work was performed.</td>
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</tbody>
</table>
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:

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

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

<table>
<thead>
<tr>
<th>Patient Risk Group</th>
<th>Construction Project Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>LOW Risk Group</td>
<td>TYPE A: I II III IV</td>
</tr>
<tr>
<td>MEDIUM Risk Group</td>
<td>TYPE B: I II III IV</td>
</tr>
<tr>
<td>HIGH Risk Group</td>
<td>TYPE C: I II III IV</td>
</tr>
<tr>
<td>HIGHEST Risk Group</td>
<td>TYPE D: IY III IV IV</td>
</tr>
</tbody>
</table>

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.

Step 3
Infection Control Considerations

- Location of sinks and dispensers for hand-washing products and hand hygiene products
- Types of faucets (e.g., aerated vs. non-aerated)
- Air-handling systems engineered for optimal performance, easy maintenance, and repair
- ACH and pressure differentials to accommodate special patient-care areas
- Location of fixed Sharps containers
- Types of surface finishes (e.g., porous vs. non-porous)
- Well-caulked walls with minimal seams
- Location of adequate storage and supply areas
- Appropriate location of medicine preparations areas (e.g., ≥3 ft. from a sink)
- Appropriate location and type of ice machines (e.g., preferably ice dispensers rather than ice bins)
- Appropriate materials for sinks and wall coverings
- Appropriate traffic flow (e.g., no “dirty” movement through “clean” areas)
- Isolation rooms with anterooms as appropriate
- Appropriate flooring (e.g., seamless floors in dialysis units)
- Sensible-use carpeting (e.g., avoiding use of carpeting in special care areas or areas likely to become wet)*
- Convenient location of soiled utility areas
- Properly engineered areas for linen services and solid waste management
- Location of main generator to minimize the risk of system failure from flooding or other emergency
- Installation guidelines for sheetrock

*Use of carpet-cleaning methods (e.g., “bonneting”) that disperse microorganisms into the air increases the risk of airborne infection among at-risk patients, especially if they are in the vicinity of the cleaning activity.
Education is needed for everyone involved with construction:

Infection control is one of the most important factors when doing construction work within a hospital. Many of the patients are immuno suppressed and are highly prone to infection. The slightest contamination with construction dust can prove harmful.

- Always follow infection control practices as directed per the facilities polices
- Erect proper containments. Containments are to be inspected for leakage, tears and that they are under negative pressure. All contractors are to observe and maintain containments through each shift. If something comes loose or opens up, STOP what you are doing and repair it.
- Use negative air machines to control airborne particles.
- Use walk-off mats (keep them damp) or sticky mats to help contain dust.
- Use booties and coveralls when directed.
- Each construction project is assigned a risk category. The required containments and protections are specifically described in the risk assessment.
- Containments should be inspected and approved by Project Supervisor or designated person before demolition or construction begins.
PROPER SIGNAGE IS REQUIRED IN CONSTRUCTION ZONES TO PROTECT ALL WHO COME NEAR OR ENTER.

INSPECT DAILY!

Ensure that proper signage goes up before the project begins and stays up until the project has been completed. Life safety exiting requirements must be maintained in and around all worksites.
Avoid dragging dust and dirt from your work site into other parts of the hospital:

- Use tacky mats, also known as walk-off mats, to collect dust and other contaminants from footwear whenever entering and exiting the job site.
- Change the tacky mats as often as necessary. When they get dirty, they are not as effective in removing dust and debris from shoes.
- Depending upon the type of construction
  - may be required to wear a coverall and shoe covers in the construction site. Coveralls and shoe covers must be removed each time someone leaves the site, not just at the end of the shift.
- If the workspace is very dusty, buddy with a co-worker to ensure that clothing is as dust-free as possible before leaving the space, by using a HEPA-equipped vacuum.
CORRIDOR ACCESS

Hospital corridors are to be kept clear of carts, ladders and tools whenever possible.

Unattended carts may not be placed in a corridor longer than 15 minutes.

At the end of the workday you must remove any items in corridors or egress pathways.

Maintain an unobstructed path to area egress point at all times.
To ensure proper containment of the job site:

- Seal unused doors with tape.
- Construct all barriers, i.e., sheetrock, plastic, or plywood, as required to seal the construction area from the non-work area.
- Use high-efficiency particulate air (HEPA) filters to control any dust and purify the air. The HEPA unit also helps keep the construction site under negative air pressure relative to the surrounding environment.
- Block vents. Work areas that contain air vents could spread dust and debris to nearby locations. Seal them tightly with plastic and duct tape or other form-fitting material.
A negative pressure environment will help to contain the construction dust and contaminants within the construction space.

A negative pressure space eliminates the possibility of contaminants passing outside of the construction area through leaks in the construction barriers.

An **air scrubber** is a portable filtration system that removes particles, gasses, and/or chemicals from the **air** within a given area. These machines draw **air** in from the surrounding environment and pass it through a series of filters to remove contaminants.
Air scrubber
- Stands alone in the center of a room with no ducting attached.
- The air is filtered and recirculated, greatly improving the general air quality. An air scrubber can be used as a negative air machine, but it requires ducting.

Negative air Machine
- uses ducting to remove contaminated air from a sealed containment area.
- The filtered air is exhausted outside of the containment area. This creates negative air pressure (a vacuum effect), which helps limit the spread of contaminants to other areas inside the structure.
Negative Pressure

If possible, a window exhaust is used to generate negative pressure at the construction site.

If there is no window for exhaust, an anteroom is constructed and the air is passed through a HEPA filter before being exhausted from the site.
The general rule of thumb is that at least 10% more air must be exhausted from the area than is supplied to it.

For example, if 500 CFM is coming in through the facility HVAC system, then at least 550 CFM must be filtered and exhausted by the PAS.

Six or more air changes per hour (ACH) are recommended for effective air cleaning during construction and renovation work.
According to the latest 2003 CDC Guidelines for Environmental Infection Control in Health-Care Facilities

- HEPA filtration is required for the capture of microbial spores and other contaminants that can potentially cause fungal infections and Aspergillosis. Airborne bacteria and fungi are typically 3 microns (0.0001”) and smaller in size, small enough to easily pass through most filters.

- Air filtration devices must therefore be equipped with true HEPA (High Efficiency Particulate Air) filters, designed to capture at least 99.97% (9,997 out of 10,000) particles as small as 0.3 microns (0.00001”) in size.
These photos represent the proper containment of areas under construction with signage and negative air equipment in place, flooring protected, walk-off mat in place, etc.

Types of Mats – There are two types of mats to be used to aide in dust containment. The first type of walk off mat is carpet and is to be kept moist at all times and must be cleaned regularly. The second type of mat is a sticky mat. The sticky mat should be used when there is danger of slipping due to moisture.
Mat?
ELEVATORS OR STAIRWELLS UTILIZED FOR DEBRIS REMOVAL OR MATERIALS TRANSPORT SHALL BE LINED WITH PROTECTIVE MATERIALS TO PREVENT DAMAGE.

ALL FLOORING (OLD OR NEW) SHALL BE COVERED AND PROTECTED DURING ALL CONSTRUCTION PHASES.

ALL HOSPITAL EQUIPMENT & COMPUTERS IN A WORKZONE SHALL BE COVERED AND PROTECTED AT ALL TIMES WHEN DUST WILL OCCUR.
These photos represent the proper containment of areas under construction with signage and negative air equipment in place, flooring protected, walk-off mat in place, etc.

Make sure containment is sealed tight

The “Clean Booth” is a self-contained unit used when working in a small area below a removed ceiling tile.
CLEAN BOOTH OPERATION – Example of Use of the clean booth in a red line area (Class IV).

Procedure:
1. While the clean booth is outside of the red line area the first person (in plain clothes or hospital supplied white coveralls) enters the clean booth and closes the door.
2. The first person will use the ladder or the side bars inside for stabilizing themselves while the booth is being moved.
3. The second person will need to gown up as per requirements for working within a red line area.
4. The second person will then push the clean booth carefully into the area where the ceiling needs to be accessed and will lock the wheels when positioned correctly.
5. The second person will arrange to plug the clean booth in for power. When the booth is plugged in, the first person will turn on the vacuum cleaner and then extend the booth up to the ceiling.
6. Once the contact with the ceiling is complete the top cover may be removed and the ceiling may be accessed.
7. Upon completion of the work in the ceiling, the ceiling tile must be installed and the top cover of the clean booth reinstalled.
8. At this point the top may be lowered down, the vacuum can be shut off and the second person can unplug the booth.
9. The booth is to be carefully pushed back outside of the red line area and the first person may then exit the booth.

Safety Items:
- Any time the clean booth is moved the person inside must hold onto either the ladder or the side bars to stabilize themselves during the move.
- The vacuum must be running any time that the booth is in the red line area and the ceiling is open.
- The door of the booth must remain closed at all times while in the red line area.
- The clean booth must be cleaned after every use.
Containment-Procedure Area

ENTRY PROCEDURE:
ENTER REDLINE AREA WEARING BLUE SCRUBS, HEAD
AND FOOT COVERS.
PUT ON WHITE COVERALLS IN CONTAINMENT VESTIBULE.
ENTER CONTAINMENT (OR/CATH LAB) AND COMPLETE
THE REQUIRED WORK.

EXIT PROCEDURE:
Enter vestibule and remove coveralls, head
and foot covers.
Put on clean head and foot covers before
exiting into redline area.
CONTAINMENT

Know the air system in your hospital: ducted air return or plenum air return above ceilings.

In all Infection Control containments, in both ducted and plenum systems, it is mandatory that return air is filtered or blocked. If filtering or construction procedures are done incorrectly, the containment is compromised and contaminated air can enter the return air plenum and be distributed throughout the system.

In the photo below, the return air grate is covered with filter media (this is correct). However, if more than one ceiling tile is removed, the filter becomes useless and contaminated return air is drawn into the plenum through the opened ceiling.

In this example, the Plenum opening in the wall is blocked preventing contamination being drawn from the work area.

Blocking or filtering is contractor choice as long as the containment negative air conditions are not compromised.

**NOTE:** In plenum ceiling work where no dust will be generated it is acceptable to temporarily remove ONE ceiling tile without blocking / filtering the plenum return. If the tile is to be left out for any length of time, the return must be filtered or blocked.
TIGHT dust containments are CRUCIAL in OR or Sterile Procedure Areas
Negative air machine manometers should register 2.0 (as a minimum). Filter should be changed at 1.0.

CORRIDOR CONTAINMENT FOR ENTERING / LEAVING THE WORKZONE

DO YOU SEE WHAT’S WRONG IN THIS PICTURE? THE PLASTIC IS BULGING OUTWARDS. THIS WORK AREA IS UNDER A POSITIVE PRESSURE CONDITION. IT SHOULD BE UNDER NEGATIVE PRESSURE!!!
Correct?
Blood Borne Pathogens

Contractors need education regarding blood borne pathogens and process for exposure events

- AVOID DIRECT CONTACT WITH ANY SUSPECTED BODY SUBSTANCE
- PLACE A BARRICADE OR SIGN BY THE SUBSTANCE TO WARN OTHERS TO AVOID CONTACT.
- CONTACT SANFORD ENVIRONMENTAL SERVICES PROMPTLY TO CLEAN AND DISINFECT THE AREA.
1. Sharps Safety:
   - Inner container has been removed, then sharps cabinets can be removed from their mounting location.
   - Special disposal is required so do not discard sharps biohazard containers in regular garbage.
Transport Waste

CONSTRUCTION DEBRIS MUST BE TRANSPORTED IN COVERED CARTS OR TUBS.

1. Tightly cover carts when moving debris out of the construction site.
2. Clean off the outside of the cart before exiting the work site.
Polices should address ceiling cavities

Remove all debris and vacuum dust from top of ceilings upon completion of work.

Things to observe on rounds:

Ceiling tiles must be replaced as soon as the work above is complete. Tiles should be installed before leaving the area.

When running cabling, no more than three (3) tiles should be removed at a time to keep open ceilings to a minimum or per hospital policy.
Ceiling
WATER DAMAGE/INCURSION

- Water damaged surfaces and construction materials must be dried promptly to prevent the growth of mold/fungus. If this does not occur, mold/fungus will contaminate the environment when work with the materials begins.
- All water damage must be addressed immediately so that it completely dries within 48 hours. Vinyl wall coverings on wall board must be lifted from the wet areas to allow the wall board beneath to dry. If only plaster is beneath the vinyl, this does not apply.
- Assure that thorough drying has occurred by use of a water meter.
- If the surfaces are not completely dried within 48-72 hours, the materials will need to be discarded and replaced.
IF MOLD IS SUSPECTED…

SUSPECTED MOLD Construction Project Supervisor and Infection Prevention immediately

MOLD SHOULD BE ABATED BY PROFESSIONALS.

DO NOT REMOVE OR DISTURB THE SUSPECTED SUBSTANCE
CLEANING

Process for cleaning work areas at the end of the day if occupied by hospital

REMOVE CARTS, TOOLS, MATERIALS, ETC.
VACUUM AND WIPE DOWN THE AREA TO REMOVE ANY LINGERING DUST.
Resources

- Facility Guidelines Institute (FGI). 2014
- Guidelines for the Design and Construction of Residential Health, Care, and Support Facilities
- Resources for Selecting Architectural Details, Surfaces, and Furnishings for Health Care Facilities
  [http://www.fgiguidelines.org/pdfs/Resources SelectingArchDetailsSurfacesFurnishings.pdf](http://www.fgiguidelines.org/pdfs/Resources%20SelectingArchDetailsSurfacesFurnishings.pdf)
- Centers for Disease Control and Prevention (CDC)
  [http://www.cdc.gov/hicpac/pdf/guidelines/eic_in_hcf_03.pdf](http://www.cdc.gov/hicpac/pdf/guidelines/eic_in_hcf_03.pdf)
- American Society of Heating, Refrigerating and Air-Conditioning Engineers (ASHRAE)
  [https://www.ashrae.org/standards-research--technology/standards--guidelines](https://www.ashrae.org/standards-research--technology/standards--guidelines)
- American Society of Healthcare Engineering (ASHE)
References

Bed Bug Management
Bed Bugs
**Bed Bug Management**

- *Cimex lectularius*, the common bed bug most adapted to living with humans, is a reddish brown bug with an oval, flattened body. They are approximately 1/4 inch long (about the size of a small apple seed) and are sometimes mistaken for cockroaches.

- Bed bugs do not fly or jump but can move quickly over floors, walls, ceilings, and other surfaces.

- Female bed bugs lay their eggs in secluded areas, depositing up to five a day and five hundred in a lifetime.

- Symptoms after the bite vary by individual but usually include itchy, red welts and localized swelling. Some persons have little to no reaction to the bites making diagnosis difficult.
How do I get bed bugs?

- Bed bugs are experts at hiding.
  - Their slim flat bodies allow them to fit into the smallest of spaces and stay there for long periods of time.
  - Bed bugs are usually transported from place to place as people travel.
- The bed bugs travel in the seams and folds of luggage, overnight bags, folded clothes, bedding, furniture, and anywhere else where they can hide.
  - Most people do not realize they are transporting stow-away bed bugs as they travel from location to location, infecting areas as they travel.
- Usually these areas are marked by dark spotting and staining, which is the dried excrement of the bugs.
- Also present will be eggs, eggshells, molted skins of maturing nymphs, rusty or reddish spots of blood, the bugs themselves, and sometimes a sweet, musty or “buggy” smell (though smell is not always present.)
What should I do?

- The environment will be inspected to determine extent of bed bug infestation.
- Examine the environment, pay special attention to cracks and crevices, mattresses, bed frames, behind wallpaper, behind picture frames, outlets, and door and window molding. Look for dark spots of dried bug excrement, light-brown molted skin of nymphs, and the bugs themselves.
  - Remove any unnecessary equipment (i.e. isolation carts, bedside tables, chairs, etc.)
  - Send belongings home with family
  - Treat/wash clothes if recommended
Minimal symptomatic treatment and good hygiene to prevent itching and secondary infections are usually sufficient treatment for most cases of bed bug bites.

A wide range of empirical treatments, including antibiotics, antihistamines, topical and oral corticosteroids, and epinephrine have been used for bite reactions with varying results.

In more extensive or severe cases, topical steroid creams with or without systemic anti-H1 receptor antihistaminic may be given.
  - Topical antiseptics or antibiotics as well as systemic antibiotics may be needed in the case of secondary infection.
<table>
<thead>
<tr>
<th>Report of bed bugs-no bed bugs found or no bites on patient</th>
<th>1. Continue to inspect patient periodically. No precautions needed at this time.</th>
</tr>
</thead>
</table>
| Report of bed bugs-no bugs found. Bites found on patient.  | 1. Double bag all clothing & belongs.  
2. Clean room thoroughly. Continue to inspect patient periodically. No additional precautions needed at this time |
| Report of bed bugs-bugs found                               | 1. Save bug in specimen cup for identification. Call Environmental Services to ID and they determine a strategy.  
2. Once confirmed remove all unnecessary equipment from the room and double bag all clothing and belongings. |
| Outpatient management of patients with a chronic            | 1. If possible: Schedule patient last appointment of the day, remove all unnecessary furniture & equipment from room. Avoid using space with carpet or upholstered furniture, bring patient directly to an exam room & minimize patient movement. |
Bed Bugs
Patient Process #1
Patient Reports: Bed Bugs

After Assessment
NO BUGS, NO BITES

Inspect patient & surroundings with each assessment

No precautions needed at this time.

After Assessment
NO BUGS FOUND
BITES FOUND ON PATIENT

Bag all Clothing & belongings (may leave out toiletries). Use large sealed bags for belongings

Inspect patient belongings and surroundings with each assessment

No bed bugs are found, no additional precautions needed

If suspicion of bed bugs, notify EVS
Call 333-0352
Bed Bugs
Patient Process #2
Patient Reports: Bed Bugs

BED BUGS FOUND

Process for PATIENT

Patient does not require isolation, employees may wear PPE until bugs contained

If possible, have patient shower and change into clean gown
Change all Linen
Bag linen, LEAVE IN ROOM, Call Laundry 36451 After hours call Security 00000
Bag all clothing and belongings (may leave out toiletries). Use large sealed bags for belongings & leave in room.
If possible send belongings home with family or friends
Remove all unnecessary equipment. CLEAN & INSPECT ALL EQUIPMENT PRIOR TO LEAVING THE ROOM with PPI wipes

If utilizing PPE PLACE CONTACT PRECAUTIONS SIGN ON THE DOOR

Process for ENVIRONMENT

Save bug in specimen cup
Call EVS (336-8352) Infection Prevention (333-8478)
EVS will determine plan and call exterminator if needed
EVS will use Steri-Fab on environment

RELOCATING THE PATIENT

Infection Prevention, EVS and Director will determine if patient needs to be relocated

BEFORE TRANSFER
Have patient shower and change into clean hospital gown
Place all patient belongings into sealed bag
Encourage items to be sent home with family & friends
If patient’s clothes need to be washed prior to discharge, call EVS
Bed Bug
Process #3
Outpatient areas and Clinics

Bed Bugs seen

Save bug in specimen container

Contain belongings in a large sealed bag. Send belongings home with patient, KEEP SEALED

Call EVS 333-6352
IF off campus call Infection Prevention at 333-6478

Patient is discharged

EVS will inspect area and determine a plan. Off Campus call contacted exterminator

Place "ROOM CLOSED" SIGN on the door. Leave all linen and equipment in the room

IF patient will be at the hospital extended period of time. Have patient change into provided sweat outfit or other provided clothes

Send Patient home in provided clothes with SEALED bag of belongings

Provide education regarding bed bug prevention
Bed Bug Process #4
Visitors of Patients with Bed Bugs

Answer these questions regarding visitors

Are bed bugs visible on the visitor?

No

Does the visitor live with the patient & bed bugs were found at the hospital?

No

Continue to assess the environment. Call EVS if bugs are seen.

Yes

Save bug in specimen container if possible.

Have visitors stay in room. Education on Bed Bug detection & prevention

Call EVS

If a sweat outfit or other clothes can be provided, have visitor change

Bag visitors' belongings in a sealed bag

If possible, have them shower and change into clothes provided

Encourage visitors to stay in patients' room. Guest lunch tray can be ordered and they should use the patient's bathroom.

Patient Relations may be consulted to determine a plan for the visitor

Visitors who reside in the same environment may be restricted from visiting at the discretion of the department Director & Patient Relations
Thermal Heat

- The thermal death point is determined by two things:
  - Temperature, and exposure time. Bed bugs exposed to 113°F will die if they receive constant exposure to that temperature for 90 minutes or more.
  - Bed bugs will die within 20 minutes if exposed to 118°F.
  - Bed bug eggs must be exposed to 118°F for 90 minutes to reach 100% mortality.
Clothes Dryer

- A loosely filled dryer set on “high” is capable of killing all bed bug life-stages and their eggs in 30 minutes.
- A dryer with a removable shelf is excellent for killing bed bugs on items that cannot be tumbled, like leather shoes, handbags, knick-knacks, even books.
- Drying time may need to be increased to reach the bed bug thermal death point.
The bag is heated to a temperature above 120°F killing all bed bugs life stages, including eggs.

The PackTite® takes much longer to treat infested items (several hours) than a hot dryer but it is completely portable and is able to treat items (like packed suitcases) that a dryer cannot.

The PackTite® sells for around $310.
Pest management specialize in bed bug control typically use steam as part of their treatment process.

A professional steamer is used to treat bed bugs on mattresses, on upholstered furniture, carpet, behind baseboards and other locations where insecticide applications may be undesirable.

Target temperatures 160-180°F
Thermal Containment

- Leave Linen in room, open draws
Place thermometers on sofa. Heat can reach into the side of the sofa.

Sofa was in containment 4hrs at 160 degrees.
Dakota Bedbug Detection
References


» University of Kentucky Entomology and Nematology Department. http://www.ca.uky.edu/entomology/entfacts/ef636.asp

» Using Heat to Kill Bed Bugs. Dini M. Miller, Ph.D., Department of Entomology, Virginia Tech