

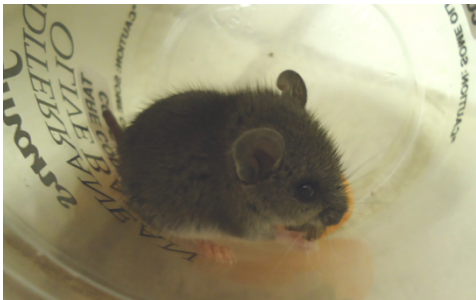
**Bed Bugs**  
*think like the enemy*

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**STOP**  
**Pests**  
in housing  
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You are a house mouse.



You are a cockroach.



University of Nebraska  
Department of Entomology

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You are a bed bug.





### What all pests need

- Food
- Water
- Shelter



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### Every infestation starts with an introduction



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### Pest management must include managing introductions



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### Find pests that get in before an infestation grows



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### Take action

Use more than one control method  
 Methods must be economical and pose the least possible risk to people, property, and the environment

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### Integrated Pest Management (IPM)

1. Inspect and monitor
2. Identify
3. Determine the scale of response
4. Respond
  - Non-chemical control
  - Changing people's behavior
  - Chemical control
  - Biological control
5. Evaluate effectiveness

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### IPM is not...

- Using only bait
- Applying more than one kind of pesticide
- A certain set of pesticides
- Using spices and herbs
- A service that can be contracted out

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### IPM is a team approach

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### Preventing pests

People	Tools	Procedures
• ...	• ...	• ...

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### Prevent introduction and spread: residents

- ☛ Keep coats, backpacks, purses, and bags off beds, recliners, and sofas at home and while out
- ☛ Inspect used furniture carefully before bringing it home—avoid it if possible
- ☛ Look for signs when sleeping away from home

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### Advice for staff, health aides, and contractors

- ✦ In units:
  - Avoid sitting or placing items on potentially infested surfaces
  - Wear a protective layer when moving infested items
- ✦ In the main office/community areas:
  - Replace fabric-covered furniture that has many crevices with plastic or metal items
  - Have residents set their belongings in plastic totes during meetings

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### Finding pest infestations

<b>People</b>	<b>Tools</b>	<b>Procedures</b>
• ...	• ...	• ...

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### Taking control of pest infestations

<b>People</b>	<b>Tools</b>	<b>Procedures</b>
• ...	• ...	• ...

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### Questions?

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### What is a bed bug?

- ✦ A blood-sucking insect
- ✦ Flat
- ✦ Range in size from a sesame seed to a apple seed
- ✦ Light brown to mahogany red depending when they last fed



**Adult bed bug feeding on a human**

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### Bed bugs are health hazards

Bed bugs do not transmit disease, but they are a pest of significant public health importance


- ✦ Cause secondary infections after people scratch their bed bug bites
- ✦ Result in stress, loss of work, loss of productivity, loss of sleep, and financial burden
- ✦ Are unwelcome in our homes and workplaces

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### Bed bug life cycle



Fed

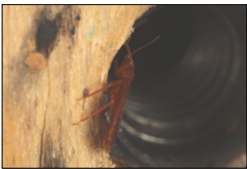


Unfed

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### Bed bug behavior

- ✦ Most active at night
- ✦ Hide in cracks and crevices, often in groups
- ✦ Cannot fly, jump, or burrow into skin... they crawl
- ✦ Hitchhike on coats, bags, furniture, wheelchairs...





Bed bug crawling into a screw hole to hide

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### What bed bugs eat and drink

Blood







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### Can be confused with...


- ✦ Ticks
- ✦ Cockroach nymphs
- ✦ Other kinds of bug bites
- ✦ Allergic reactions to chemicals




Tick




Mosquito Bites



Cockroach Nymph



Bat Bug




Spider Beetle

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### Signs of bed bugs

- ✦ Dead bed bugs
- ✦ Live bed bugs
- ✦ Bites
- ✦ Fecal spots
- ✦ Shed skins



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### Where bed bugs live

Beds, sofas, bedside tables, recliners, picture frames...

● = Hot Spot

### Areas at-risk for introduction and infestation

- ✦ Introduction is likely where people
  - frequently travel
  - set down personal belongings
  - sit or lay down for long periods of time
- ✦ Infestation is likely where bed bugs can
  - Crawl (upholstered furniture or bedding)
  - Feed on a person for 5 minutes without being detected
  - Hide in cracks or folds

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### Areas prone to introduction vs. infestation

Area	Introduction?	Infestation?

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### NH Bed Bug Law

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### Interview

- Find out where people sleep
- Find out where people put the things that come in/out of the unit
- Note financial, physical, or cognitive limitations that could influence treatment
- Use a flashlight and look around sleeping areas and areas where introduction is likely

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## Inspection

- ✦ Always use a flashlight
- ✦ If bed bugs are found, inspect all adjacent units
- ✦ Two types
  - ✦ Visual
  - ✦ Scent detecting canine

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## Monitoring

- ✦ Trap and kill bed bugs
- ✦ Determine how bad the infestation is
- ✦ Two types
  - Passive
  - Active



Passive, moat-style interceptor

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## Include the resident in the plan

- Encourage patience and cooperation
- Ask residents to NOT: fog/bomb, use their own pesticides, throw away items, change too much until a professional arrives to inspect and treat
- Give them control options: vacuum with a pantyhose, clothes dryer for 30 minutes on high heat, encasement and interceptors, isolate belongings in plastic totes/bags
- Give them an idea of the treatment timeline

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## Treatment options

<ul style="list-style-type: none"> <li>• Pesticides                             <ul style="list-style-type: none"> <li>• Spray</li> <li>• Dust</li> <li>• Fumigation</li> </ul> </li> <li>• Heat                             <ul style="list-style-type: none"> <li>• Dryer</li> <li>• Steam</li> <li>• Container</li> <li>• Whole unit</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• Freezing                             <ul style="list-style-type: none"> <li>• Liquid CO<sub>2</sub></li> <li>• Chest freezer</li> </ul> </li> <li>• Vacuuming</li> <li>• Isolation                             <ul style="list-style-type: none"> <li>• Encasements</li> <li>• Clear bags</li> <li>• Closed plastic containers</li> <li>• Interception devices</li> </ul> </li> </ul>
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**Pest Prevention by Design**

Authoritative guidelines for designing pests out of structures





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## Questions?

<p><b>In-house options (minimum training)</b></p> <ul style="list-style-type: none"> <li>✦ Encasement</li> <li>✦ Monitoring</li> <li>✦ Quick (15 min) visual inspection</li> <li>✦ Steam</li> <li>✦ Clothes Dryer</li> <li>✦ Vacuum</li> <li>✦ Heat chamber (FL model)</li> <li>✦ Diatomaceous Earth (APPLICATOR'S LICENSE)</li> <li>✦ Resident training/support</li> </ul>	<p><b>Leave it to the experts</b></p> <ul style="list-style-type: none"> <li>✦ Canine inspection</li> <li>✦ Whole-unit heat treatment</li> <li>✦ Pesticide application</li> <li>✦ Thorough inspection</li> <li>✦ Active Monitoring</li> </ul>
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## IPM resources




**Websites**

- The Northeastern IPM Center's IPM in Multifamily Housing website and blog: [www.stoppests.org](http://www.stoppests.org)
- The National Pesticide Information Center: <http://npic.orst.edu/>
- NH Bed Bug Action Committee: [www.nhbedbugs.org](http://www.nhbedbugs.org)
- CT Coalition Against Bed Bugs: [www.ct.gov/caes/cwp/view.asp?a=2826&q=437580&caesNav](http://www.ct.gov/caes/cwp/view.asp?a=2826&q=437580&caesNav)

**Resource**

- Pest Prevention by Design Guidelines

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## HUD's IPM guidances

- PIH 2011-22: Promotion of Integrated Pest Management (IPM)
- Notice H 2011-20/PIH 2012-17: Guidelines on Bed Bug Control

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www.StopPests.org

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[www.stoppests.org/request](http://www.stoppests.org/request)

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