Safe, Decent, and Pest-Free Housing

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The Northeastern IPM Center

Outline

- Healthy homes
- Integrated Pest Management (IPM) training in public housing
- Your IPM action plan

15 minute break

- Know the enemy
  - Cockroaches
  - Rodents
  - Bed bugs

Making homes healthy

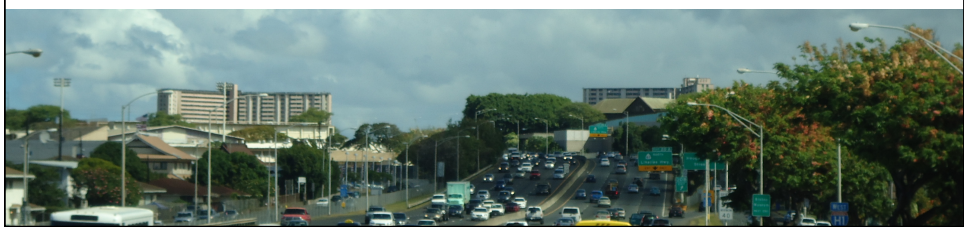
- IPM is part of a nationwide Healthy Homes movement to reduce housing-based health hazards
- A healthy home is:
  - Dry
  - Clean
  - Ventilated
  - Safe
  - Contaminant-free
  - Maintained
  - **Pest-free**



Cockroach infestation in a smoke detector

IPM training in public housing

- Prepare trainers to deliver the one-day training
- Develop a curriculum and set of supporting materials available at www.stoppests.org
- Run IPM trainings at conventional public housing sites across the U.S.



IPM in public housing background

Information based on

- National Center for Healthy Housing (NCHH) training materials
- Researchers/ trainers
- The National Pest Management Association (NPMA)
- PIH 2011-22: Promotion of Integrated Pest Management (IPM)

Training agenda

Morning

- Overview and Introductions
- Cockroaches
- IPM and Pesticide Use
- Indoor Demonstrations
- *Working Lunch*
- Video

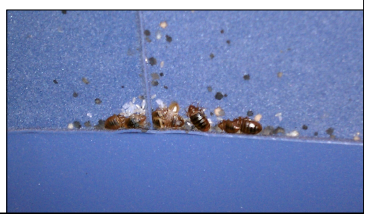
Afternoon

- Roles and Responsibilities Panel
- Rodents
- Outdoor Demonstrations
- Bed Bugs
- IPM Exam and Course Evaluation

Priority pests

- Cockroaches cause asthma in infants, trigger asthma attacks, and contaminate food
- Rodents such as mice and rats carry diseases, bite, destroy property, may cause fires, and may trigger asthma attacks
- Bed Bugs and their bites are a nuisance and are expensive to eliminate





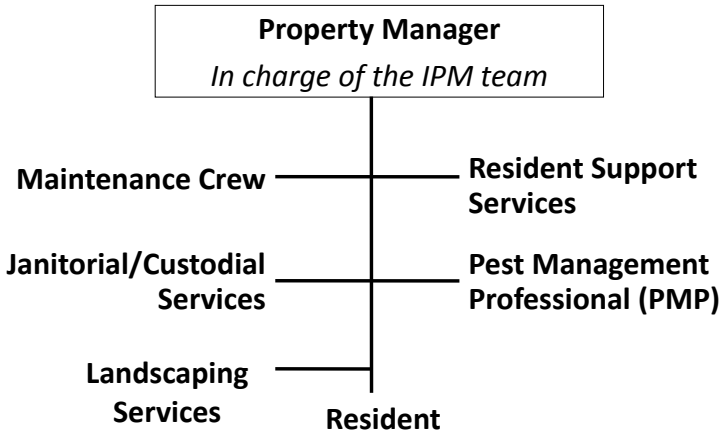
Integrated Pest Management defined

In a structural setting, an IPM program consists of

1. inspection,
2. identification,
3. establishment of threshold levels,
4. employment of two or more control measures (which may be cultural, mechanical, biological, or chemical), and
5. evaluation of effectiveness

(Adapted from the National Pest Management Association's Urban IPM Handbook, 2006)

The IPM team



Pest problem solving—IPM

1. Inspect
2. Identify
3. Establish thresholds
4. Take control measures
5. Evaluate effectiveness

1. Inspect

- Visual inspection
- Interview
- Monitor



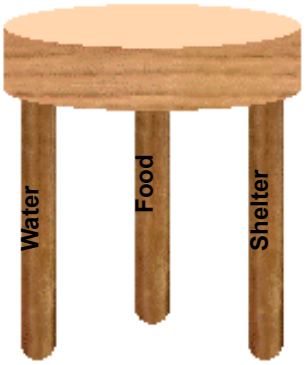
Sticky trap monitors from one unit

2. Identify



What all pests need

- Food
- Water
- Shelter



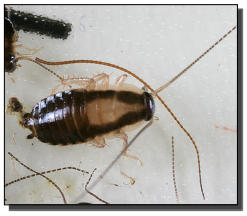
3. Determine the level of response



Mosquito Bites



Tick



Cockroach Nymph



Bat Bug

4. Employment of 2 or more control measures

- Cultural, mechanical, biological, or chemical
- Strategies chosen should be ones that are:
  - Least disruptive of natural controls;
  - Least hazardous to human health (including mental health of the resident);
  - Least toxic to nontarget organisms;
  - Least damaging to the general environment;
  - Most likely to produce a permanent reduction of the pest population; and
  - Practical in terms of time and expense.

Control measure: cultural

- Residents and staff change practices or habits
- Residents may require education or hands-on support
- Guidance should be catered to the resident
  - translation or pictures,
  - provide detailed directions, and
  - refer to specific areas and conditions in the home

Cultural continued

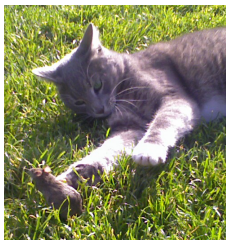
- Consider the routines for:
  - Food preparation
  - Food storage
  - Trash removal
  - Eating (locations in the home)
  - Acquiring infested items and bringing them home, and
  - Cleaning
- Focus areas are determined by the pest:
  - Food sources: human food, pet food, cardboard glue, grease around the stove…
  - Water sources: dripping faucets, sweaty pipes, plant saucers, sinks…
  - Shelter (a place to hide)…

Control measure: mechanical



Control measure: biological

- Biological control is the use of parasites, predators, or pathogens to control or manage pests.
- Not usually applied in structural IPM.
- Cats can't be relied on for rodent control.



Control measure: chemical

- Using pesticides—chemicals that kill pests.
- Only licensed pest management professionals should apply pesticides.
- Pesticides should work *with* other control measures to gain sustainable control.
- Choose the lowest risk pesticide *for the job*.
- Risk = toxicity + risk of exposure

What is green?

5. Evaluation of effectiveness

- Use monitors, searchable work order codes, and service reports.
- Assess and adjusts the control measures that have been employed.
- Plan to evaluate should
  - Identify areas overlooked;
  - Enhance program effectiveness;
  - Reapply or revise any pest management procedures as appropriate; and
  - Monitor for new infestations.

How to know if you are getting IPM service

- Focus on prevention and monitoring
- Technicians focus on the source of the problem
- Methods such as exclusion, vacuuming & trapping are commonplace
- "Sprays" or "fogs" aren't commonplace
- Time spent relative to the infestation
- Least risk products and application methods used

Questions?



Who's to blame for pests at a housing authority?

- Residents
- Housing Authority Staff
- Housing Authority Management
- Pest Control Company




Common Issue
Pest control contractor's service


Common Issue
Local municipality's trash pick up
CAUTION
CAUTION

Common Issue



Identify focus areas

- Monitor and inspect every unit
- Look through service records and work orders for trends
- Listen to staff and residents

Solve problems

- Allocate time and resources to focus areas
- Use unit turnover as an opportunity
  - Eliminate pests
  - Reduce the risk of pest infestation
    - Seal up holes and crevices where pests hide
    - Educate the incoming resident
- Track data from work orders and PMP service reports to identify trends and track efficacy



Monitor under a well-sealed sink

Focus units & housekeeping

- Require housekeeping classes that focus on taking food, water, and shelter away from pests
- Case management
- Reach out
  - Family members
  - Faith-based organizations
  - Local support agencies
- Motivate with lease enforcement

Focus units & the PMP

- Vacuum to achieve initial knock-down and remove pests and evidence
- Visit every room
- Spend time in focus units
- Communicate with the resident
- Offer to give trainings
- Leave detailed recommendations on the service report

Focus units & maintenance

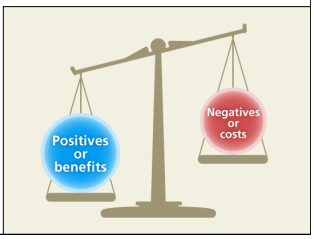
- "Exclusion" or "pest-proofing"
- Door sweeps
- Screens
- Seal around plumbing/electrical wall penetrations
- Seal cracks and crevices in kitchens and bathrooms
- Follow PMP's recommendations

The Results of the Team Approach

- An inspection and monitoring system that finds pests
- A reporting system that identifies areas of improvement
- Units are prepared to receive effective treatment
- Communication that empowers all
- Fewer pests and a healthier environment

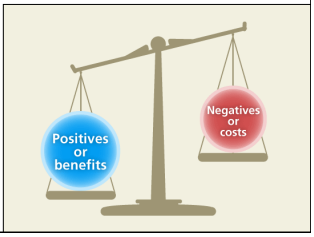
Program costs

- An IPM budget includes
  - Materials for caulking and sealing holes
  - Free items for residents in need: cleaning supplies, mattress encasements, monitors, etc.
  - An IPM contract, including inspection and monitoring

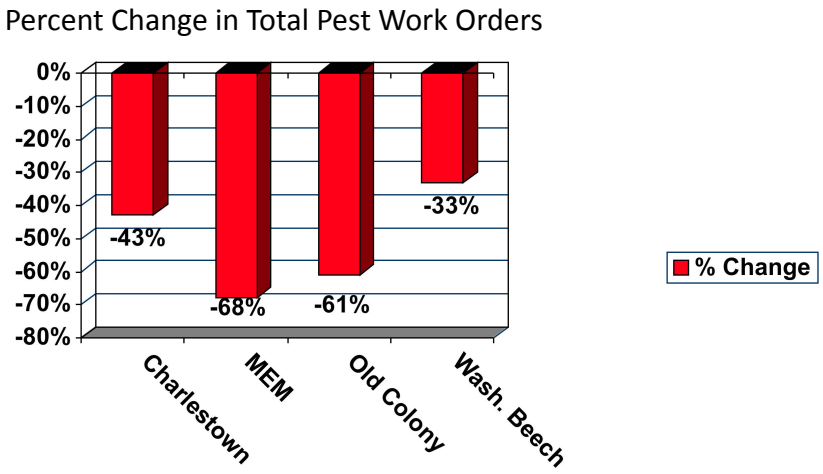


Expected program outcomes

- Increased cooperation and communication
- Decreased pesticide applications
- Infestations limited to periodic introductions—no high-level infestations
- Increased partnership with outside agencies
- PHA will be a community leader for pest-free initiatives



Boston's success



What we've learned

- Executive management must be supportive
- Start your IPM program at a pilot site
  - Licensed pesticide applicator
  - Enthusiastic property manager
  - Staff time and funding
  - Small enough to cover the entire building/AMP

What we've learned

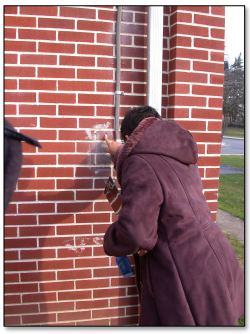
- Educate staff, residents, home health aides, and community partners—give everyone the basics and have each person commit to doing their part
- Have a continuity plan for staff and resident turnover

What we've learned

- Focus resources on "focus units" until the problem is solved
- Renovation and turnover are IPM opportunities
- No one wants to live or work with pests, but there is a level of acceptance in public housing
  - IPM delivers results
  - People's expectations for pest control can change

How to start

- Hire a qualified pest management firm or get staff licensed
- Pick a pilot site
  - ~100 units
  - Enthusiastic and willing property manager
  - Active tenant council
- Incorporate pest-specific codes into your work order system
- Train site IPM team members using resources from www.stoppests.org



A property manager inspecting building exteriors for holes

Maintain and expand pest-free housing

- Inspect new residents' homes within 90 days of move-in
- Ensure the PMP gets access to units
- Teach everyone to prevent, inspect, and monitor so introductions never turn into infestations
- Expand program to other sites

Brainstorm

- IPM planning team:
- Potential pilot sites:
- Potential local partners:
- Ideas for implementation:

Questions?

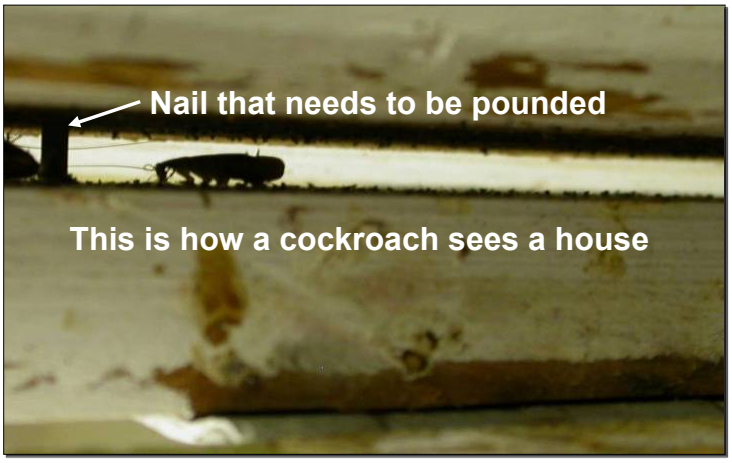
Know the enemies

- Food
- Water
- Shelter
- How it gets in
- Control options





Think like a cockroach



What is a cockroach?

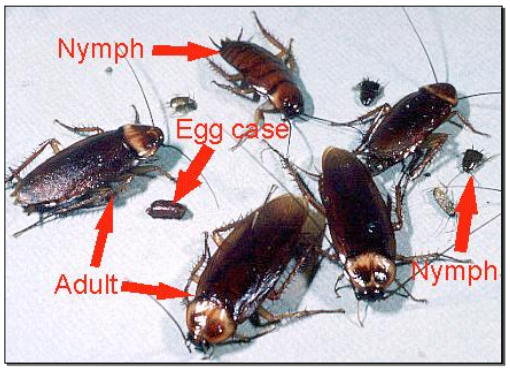
- An insect
- Lives in areas where humans provide food and water
- Active at night

  If you see cockroaches during the day, the infestation is serious

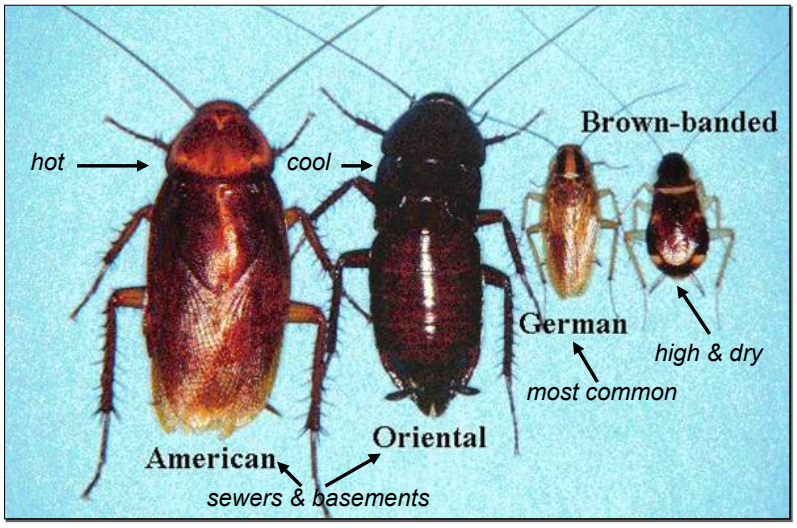


What is a cockroach?

- Multiple eggs in each egg case
- Many eggs means many nymphs (babies)
- Nymphs look like small versions of the adults



Common cockroaches



Signs of cockroaches

- Live cockroaches
- Dead cockroaches and their parts
- Frass
- Egg cases

Prevention and control: sanitation

- Good sanitation makes pest control work
- Eliminate hiding spots, food, and water available at night by
  - cleaning the kitchen
  - reducing clutter
  - throwing away dead cockroaches
  - cleaning frass and areas where there were cockroaches with simple soap and water



Prevention and control: exclusion

Seal or fix cracks, peeled wallpaper and shelf liners, or holes that cockroaches could get through.

Use

- silicone caulk
- copper mesh
- screens
- door sweeps—always on boiler rooms and exterior doors



Prevention and control: Targeted chemical use

- Sanitation first!
- Maintenance staff and residents should not spray. Spraying should be a last resort and done only by a PMP
- Read the ENTIRE pesticide label before buying, using, storing, or disposing of a product
- The label is the law!
- Follow the label directions closely

Prevention and control: baits

- The most effective pesticide option
- Won't work if contaminated by strong- smelling cleaners or other chemicals, pesticide sprays or foggers, or nicotine from cigarette smoke
- Use in every room where inspection finds evidence



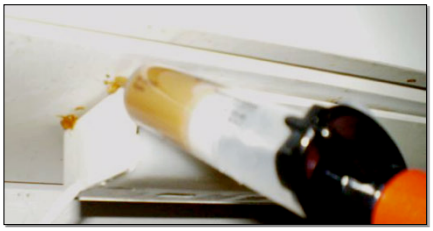
Gel Bait



Bait Station

Prevention and control: Baits

- The bait needs to be the only food in the area—sanitation first!
- Slow to kill: Cockroaches feed on the bait and take it back to their hiding spots where other cockroaches live



PMP's gel bait applied under a drawer

Prevention and control: Insecticidal dusts

- Least toxic active ingredients you may know:
  - boric acid
  - diatomaceous earth
- How they kill cockroaches:
  - A stomach poison
  - Dry them out
  - Contact kill
- Long-lasting if dry

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Prevention and control: Insecticidal dusts

- Effective if used correctly
- Light dusting—never piles
- Use in walls before fixing them if infestation exists
- Unit location may justify application under and behind cabinets at turnover or when making large repairs…
  but clean first!



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Incorrect use of insecticidal dust

Prevention and control: insect growth regulators (IGRs)

- Interfere with cockroach growth and egg hatching
- In baits, sprays, aerosols, and powders
- Take a month to work
- Stay effective for a long time
- Compatible with other IPM methods; may enhance baits

Don't use over-the-counter sprays and foggers

- Over-the-counter sprays and foggers are not part of IPM in multifamily housing
- They are not compatible with baits
- Cockroaches develop resistance



Rodents

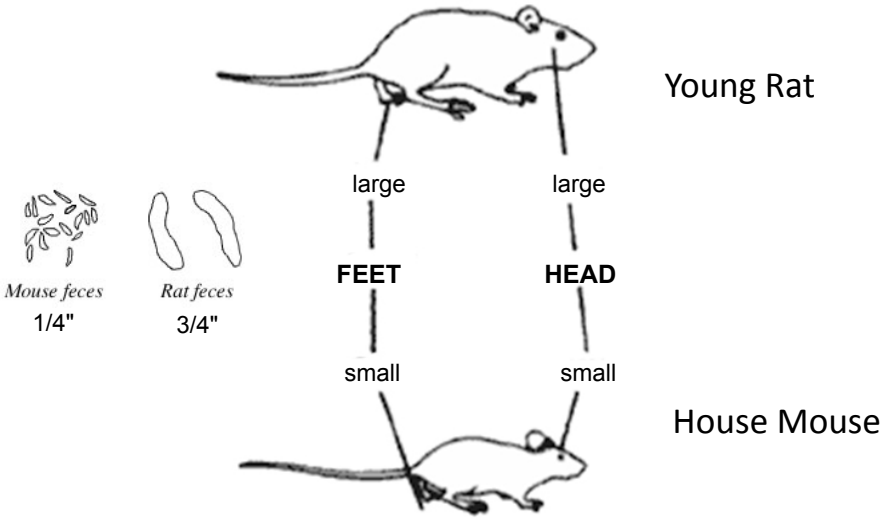


What is a rodent?

- Gnaw to wear down their teeth and get where they want to go (can cut anything softer than steel)
- Are most active at night
- Make lots of babies fast
- Travel the same paths nightly, staying close to walls



Rodent identification



Rats

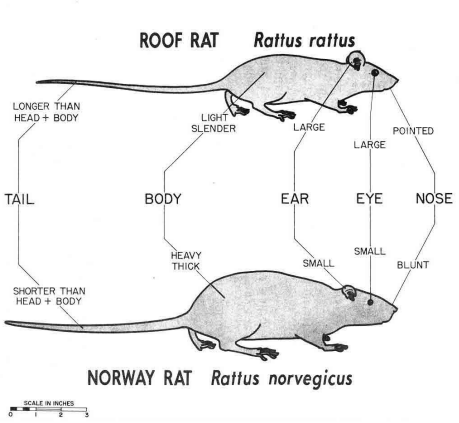
- Will travel 450 feet from their burrow, but prefer to stay close to the nest
- Usually live outside and come inside for food and water



Norway rat burrow

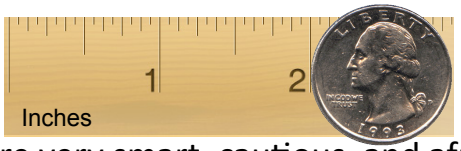
Rodent identification

- Roof rats nest up high
  - Occur in southern states and along the west coast
- Norway rats burrow in the ground
  - Occur throughout the U.S



Rats

- Need a hole the size of a quarter to enter



- Are very smart, cautious, and afraid of new things
- Need water every day

Mice

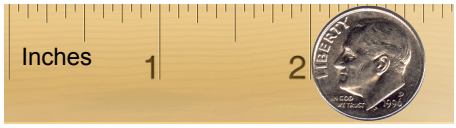
- Breed rapidly
  - A single pair can become an infestation quickly!
  - Take action when evidence of ONE mouse is seen or heard
- Don't travel far—just 30 feet from their nest



One day old mouse pups

Mice

- Mice need a hole the size of a dime to enter



- Mice are curious
- Don't need to drink water daily

Signs of rodents

- Sightings
- Noise
- Gnaw marks
- Nests
- Rat burrows
- Droppings
- Holes and rub marks
- Indicator pests

What rodents eat and drink

Rodents eat

- Human and animal food available in the area

Rodents drink

- Rats drink water
- Mice can get the water they need from their food

Where rodents live

- Rats: Outside, but will come in if the place is hospitable
- Mice: Nest in walls, stored fabric, cars, boxes, or the ceiling



Rat burrow by a wall



Mouse nest in a hat

Control strategies for rodents

Sanitation

Exclusion

Traps

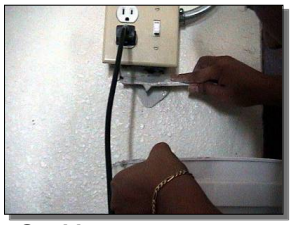
Rodenticides

Prevention and control: exclusion

For a hole, crack, or gap…



Stuff it



Seal it



Check it often

Prevention and control: traps

- Effective and reusable
- More ARE better
- Check often
- Place the trap against the wall where rodents travel. (The edge of the trap must touch the wall.)







Trap set correctly so it snaps towards the wall

Trap placement is key

Place the trap against the wall where rodents travel.
(The edge of the trap must touch the wall.)



Trap set correctly so it snaps towards the wall

How to trap rodents

Bait with what they're eating or using to nest

Mice

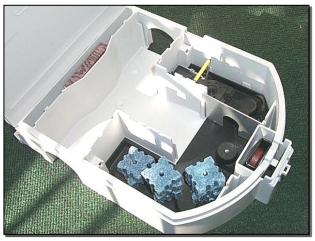
1. Bait & set many traps
- 6 traps for each mouse
- At least 3' apart
- Set immediately

Rats

1. Place many traps
2. Bait and leave UNSET until rats are readily feeding
3. Bait and set all traps

Prevention and control: targeted chemical use

- The label is the law
- All rodenticide labels require tamper-resistant stations
- Read the label on both the station and the bait
- The bait station should be secured, locked, and labeled
- If the rodents are inside, consider using traps



An opened bait station

Bed Bugs

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

Why they're back

- Change in pesticide availability
- Change in pesticide use patterns
- More travel/ mobility of people
- More infested locations
- Pesticide resistance
- Lack of preparedness of society in general

Bed bugs are health hazards

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

- 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

Bed bug life cycle



Fed



Unfed

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

Signs of bed bugs

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



What bed bugs eat and drink

Blood

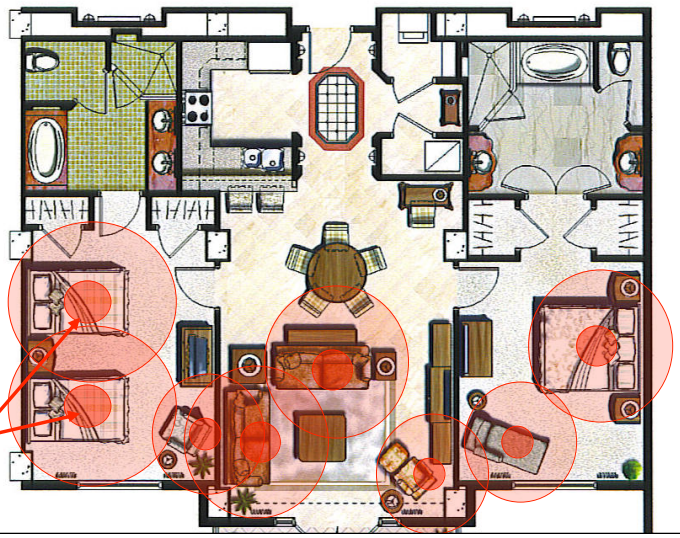




Where bed bugs live

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

= Hot Spot



Identify 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
  - get a grip: upholstered furniture or bedding;
  - get a meal: feed on a person for 5 minutes without being detected; and
  - get out of the way: hide in cracks or folds

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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Prevent introduction and spread: residents

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

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

Who is responsible?

- The PMP gives all instructions after inspection
- Assign realistic preparation responsibilities, taking into consideration financial, physical, and mental limitations of those involved
- Instructions are ideally carried out by the person who owns the materials

<u>If they are unable</u>
Family & friends
Building staff
Aides
Nonprofit groups
Contracted companies

<u>If they are unwilling</u>
Fall back on lease, job description, or other existing formal agreement

Treatment options

- Vacuuming
- Isolation
  - Encasements
  - Clear bags
  - Closed plastic containers
  - Make the bed an island
- Freezing
  - Liquid CO_2
  - Chest freezer
- Heat
  - Dryer
  - Steam
  - Container
  - Whole unit
- Pesticides
  - Spray
  - Dust
  - Fumigation

A review of what you should do

- Educate everyone about what they can do to prevent bed bugs
- Prepare before bed bugs are reported by minimizing clutter and installing encasements and monitors
- Inspect and monitor
- Respond rapidly with a professional before the infestation grows and spreads

Questions?



IPM resources

Websites

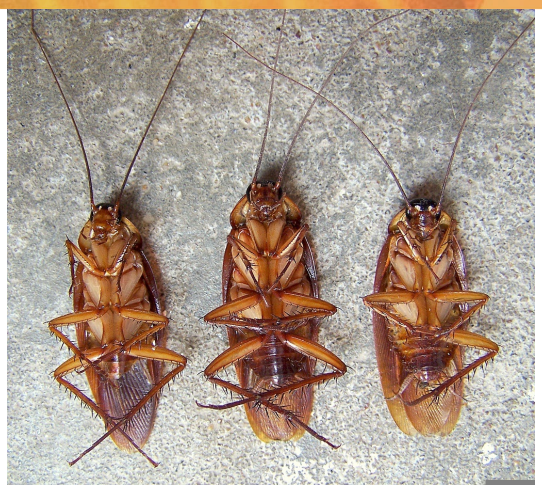
- The Northeastern IPM Center's IPM in Multifamily Housing website and blog: www.stoppests.org
- The National Center for Healthy Housing: www.nchh.org
- The National Pesticide Information Center: http://npic.orst.edu/
- Boston's Healthy Pest Free Housing Initiative: http://www.bphc.org/hpfhi/AboutUs/Pages/home.aspx
- HUD's Office of Healthy Homes and Lead Hazard Control

People

- Allison Taisey: aat25@cornell.edu or 607-220-6417
- Local Cooperative Extension Office: http://www.csrees.usda.gov/Extension/

STOP Pests in housing
www.StopPests.org

The end.



Thank you for having me!