Bed Bugs Are Back!

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A Little History

1700s: Colonists bring bed bugs to Americas

1800s: Rich & poor alike are plagued

Early 1900s: 1/3 of all residences infested in some cities; in low income areas nearly all have been infested at some point

1970s: Practically eliminated in Western cities

1990s: Worldwide resurgence
Why the resurgence?

One reason is that we’ve changed the way we control pests in homes.

– We more often use baits instead of sprays.
  • Baits are safer, but regular baseboard spraying may have kept bed bugs in check.

– Bed bugs are now resistant to many of our insecticides.
Global travel has increased tremendously and bed bugs were never eliminated in many parts of the world.
Urban living increases the likelihood and speed of spread.
We have too much stuff!
Impact on workplaces and public spaces is growing
Impacts can be severe: Stress and Insomnia
Desperation leads to DIY.
The Myths of Bed Bugs, Cleanliness and Poverty
I CAN'T GET BED BUGS,
I WENT TO PRINCETON
Bed bugs are a pest of exposure.

Anyone can get them!
No correlation between cleanliness and bed bugs
But…

- **Clutter** provides huge amounts of harborage
- **Clutter** makes it hard to inspect for bed bugs
- **Clutter and filth** make it very hard to treat for bed bugs
Poverty doesn’t cause bed bug infestations
But...

Low income households are most likely to face serious infestations
This affects the spread of bed bugs because

- Low income households can’t afford treatment
- May be afraid to tell landlord
- May not *know* they have bed bugs
  - Elderly, mentally ill, disabled
- Most landlords lack knowledge and unwittingly contribute to spread
- Fear, ignorance, lack of funds = severe infestations
- Severe infestations = greater likelihood of spread
NEW YORK HAS BED BUGS
PROTECT YOURSELF
(877) 284-5551
www.protect
Medical, Social & Emotional Effects of Bed Bugs on Society
Bed Bug Bites

Feed on blood with piercing/sucking mouthparts

Both adults and nymphs feed on blood.
Bed Bug Bites

• Bite is similar to a mosquito bite
• Allergic reaction to injected saliva
  – Reaction varies
  – Many people do not react at all
• No one can identify a bed bug bite from looking at it.
Bed Bug Bites

- Most common on exposed skin
- Potential for secondary infection from scratching
- Mainly feed at night, but will feed in the day
Currently, there is no evidence that bed bugs vector disease.
But they can cause…

• Severe psychological stress
• Economic stress
• Insomnia that impacts workers
• Dangerous exposure to pesticides from self treatment
Psychological Stress

- Sleep deprivation
- Anxiety about going to bed
- Paranoia about tiny specks
- Hypersensitivity to itching
- Sense of shame, and fear of reporting
- Isolation—fear of travel and socializing
Financial Stress for Homeless Care Provider

- Monitoring & cleaning consume staff time
- Treatment is very expensive & disruptive
- Furniture may have to be replaced
Bed Bugs Can Compound Other Stressors Homeless Individuals Face

- Transportation
- Food
- Housing
- Health needs
Bed Bug Biology
Cimex lectularius
Common Human Bed Bug

• Feeds primarily on humans but will attack chickens, bats, rabbits and other mammals
• Worldwide distribution
• Ancestor probably a bat parasite that utilized cave dwelling humans
• Earliest record c.1350 BC in Egypt
# Bedbug Life Cycle

4 Weeks - 5 Months Depending On Conditions

<table>
<thead>
<tr>
<th>Eggs</th>
<th>1st Instar</th>
<th>2nd Instar</th>
<th>3rd Instar</th>
<th>4th Instar</th>
<th>Unfed Adult</th>
<th>Fed Adult (engorged)</th>
</tr>
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<tbody>
<tr>
<td>Actual Size 1 - 5 mm</td>
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Female bedbugs lay between 200 and 500 eggs during their lifetime. After each bloodmeal the instar will molt. Each instar will molt 5-6 times before becoming an adult. Adult bedbugs are flat until they engorge themselves with a bloodmeal. Adult bedbugs can live 10 or more months WITHOUT a bloodmeal.
Bed Bug Nymphs

Nymphemerging from an egg capsule

Nymphs beside the head of a pin
Nymphs Feeding

A nymph becoming engorged with blood.

A fully engorged nymph.
Adult bed bugs next to a dime
• No wings—cannot fly
• Cannot jump
• Can walk very quickly
• When sense danger: freeze and drop to floor
• Adults can survive 3 to 5 months without feeding
• Bedbugs hide in confined spaces often with many other bedbugs
• Usually nocturnal
• Can travel long distances for a blood meal but usually found near host
• Heat is immediately lethal at 118°F for adults (122°F for eggs)
Behaviors that Make Bed Bugs Hard to Control

- Small and hard to find
- Hide in cracks and crevices; inside walls
- Easily move through walls to adjoining rooms
- Easy to accidentally transport
- Can live long periods without feeding
- Eggs are very small and glued to surfaces (also resistant to pesticides)
Bed Bug Signs

Staining and live adults on sheets.
Bed Bug Signs

Fecal Stains on wall
Bed Bug Signs

Fecal stains on bed frame
Eggs

Cast skins, fecal spots, empty egg cases
Bed Bug Signs

- Live Bugs
- Cast skins and/or eggs
- Stains on bedding, furniture or walls
- Bites
- At high population levels: sickly sweet odor
BED BUG PREVENTION and CONTROL
Prevention First

• Follow County bed bug management procedures
• Engage clients to help w/the problem
• Seal cracks and crevices
• Beware of used furniture & clothing!
• Don’t bring in items found on the street
Most Important for Prevention:

• Follow & enforce bed bug mgmt. procedures (cchealth.org/services/homeless)

• Inspect daily (a small infestation is much easier to control)

• Be vigilant!
Don’t take bed bugs home!

• Wear white coveralls or light-colored clothing when doing bed bug work

• Inspect yourself and your belongings if you suspect you’ve been near bed bugs
Components of Successful Control for Shelters

- Using the County’s management procedures (ccchealth.org/services/homeless)
- Thorough inspection/continual monitoring
- Cleaning and clutter control
- Continued monitoring

AND… did I mention Monitoring?
Inspection and Monitoring

- Necessarily painstaking
- Time consuming
- Difficult to be 100% sure either way with a small infestation
But, without an inspection you DEFINITELY CANNOT be sure of anything.
Inspecting for Bed Bugs
Canine Assisted Inspections

- Detection by scent
- Can be very effective
- Is much faster than human inspection
- Has its shortcomings
Problems with Canine Inspection

- Poor training of dog or handler  *Caveat emptor!*  
  - Dogs unable to distinguish old from current infestations  
  - Cross training that makes alerts unclear  
  - Handlers lacking knowledge of bed bugs  
- Handler failing to visually confirm alert  
- Air currents moving scent around

Dog alerting its handler to a possible find
Physical Controls

- Targeted vacuuming
- Clutter Control
- Heat treatments
- Mattress encasement
- Traps
- Soapy water for drowning
Targeted Vacuuming

Great for quickly reducing large populations

- Cannot eliminate an infestation
- Bed bugs cling tightly to rough surfaces
- Eggs are extremely difficult to dislodge
- Vacuums can become infested & spread bugs
- Use soapy water in bottom of shop vac to drown bugs
Clutter Control

• Clutter makes it so hard to inspect
• Makes it so much harder to treat
“Dry” Steam Treatments

• Will kill all stages, including eggs
• Need a commercial machine with low vapor flow and high temperature
• Surface being treated should measure 160° F to 180° F
• Applicator must be diligent and meticulous
Problems with Steam

- No residual control, and slow process
- Only kills bed bugs directly impacted by steam
- Can moisten articles enough to cause mold
- Can raise humidity in room and cause mold
Heat “Fumigation”

- Can treat whole room, apartment unit, house
- Some mobile units available
Heat “Fumigation”

A heat chamber works really well.

This “hot box” is made from sheets of rigid insulation taped together. A fan and an oil heater are placed inside along with an indoor/outdoor thermometer.
Clothes Dryer

- Extremely effective
- 30 minutes on ‘high’ heat
- Can put all kinds of things into a dryer, as long as they go in dry
  - Shoes
  - Wool suits, sweaters
  - Backpacks
  - Stuffed animals
Metal Beds

• Metal beds will not prevent bed bugs but,
  – They can be easier to clean and
  – Provide very few hiding places
• Beds should NOT be tubular. (1000’s of bugs can hide in the tubes.)
• Beds should be welded rather than held together with bolts or screws. (Bed bugs will hide in screws and bolts.)
Mattress Encasements

• Can’t prevent bed bugs
• But do keep bed bugs out of the mattress
• Make the mattress easier to inspect and clean

This mattress is fully enclosed in vinyl.
Passive Traps/Monitoring Devices

• ClimpUp® Interceptors are inexpensive.
• They can work under or beside furniture.
• Interceptors can protect beds.
• Interceptors can provide an early warning system.
  ➢ They can be used to detect low level infestations.

ClimpUp® Insect Interceptor
ClimbUps WON’T protect the bed here.

Properly deployed ClimbUps—nothing is touching floor or walls
Soapy Water

- Bed bugs caught with the fingers can be placed in soapy water to drown
- Soapy water in a spray bottle can be used to slow down a bed bug so it can be picked up
Cleaning Solution

- You can use your regular cleaning solution to wipe down beds and mattresses.
- Don’t use alcohol--too flammable!
Insecticides

• No insecticides work very well on bed bugs.
• Insecticides should be one component of many in a professional treatment program.
• Employees should not use insecticides.
• If it gets out of control, call a professional.
• Encourage residents to alert you immediately: a small infestation is much easier to combat.
Don’t throw everything away!

• Most furniture can be inspected and treated.
• If you throw anything away that is infested, destroy it or mark it as infested.
Supplies and Equipment

- Small packages of laundry detergent
- A good vacuum cleaner with a disposable bag (or a shop vacuum)
- Commercial steam machine (Steamax®-STM-BASIC)
- Coveralls and latex gloves
- Clean solution in spray bottle
What you can do:

• Educate yourself.
• Use the County’s Bed Bug Management Procedures: cchealth.org/services/homeless
• Be vigilant!
• Encourage clients to report sightings.
You can contact me for

• Reporting infestations
• Bed bug questions

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