



# Bed Bugs Best Management Practices for Assisted Living Facilities (ALFs)

Developed by: \_\_\_\_\_  
Florida Bed Bug Workgroup



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Florida Department of Agriculture and Consumer Services  
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# BACKGROUND

The purpose of this document is to provide Bed Bug Inspection, Monitoring, Preventative and Control guidance to the ALFs in the State of Florida as well as the Agency for Health Care Administration (AHCA) which is the agency responsible for regulating Assisted Living Facilities. Recently there have been Bed Bug complaints made to AHCA as well as the Florida Department of Agriculture and Consumer Services (FDACS).

The following Best Management Practices with input from the Florida Pest Control Industry, should benefit the Assisted Living Facilities as well as the Agency for Health Care in understanding the complex issue of controlling bed bugs in these facilities.



# WHO REGULATES ASSISTED LIVING FACILITIES?



The Agency for Health Care Administration is responsible for regulating Assisted Living Facilities in the State of Florida.

The Division of Health Quality Assurance is responsible for the licensing and regulation of assisted living facilities, adult family care homes, and adult day care centers.

These programs assist the elderly or adults with disabilities to live as independently as possible while also receiving support and care.

## **Agency for Health Care Administration**

2727 Mahan Drive  
Tallahassee, FL 32308

## **Complaint Hotline**

(888) 419-3456

## **Bureau of Health Facility Regulation- Assisted Living Unit**

2727 Mahan Drive - Mail Stop #30  
Tallahassee, FL 32308  
(850) 412-4304  
(850) 922-1984

## **Bureau of Health Facility Regulation-Long Term Care Unit**

2727 Mahan Drive - Mail Stop #33  
Tallahassee, FL 32308  
(850) 412-4303  
(850) 910-1512

## A. WHAT ARE BED BUGS?

The common bed bugs (*Cimex lectularius*) are nocturnal small insects that feed on both animal and human blood that have been long known to be a public health pest. Bed bug bites cause itchy bites and are generally irritating to their human hosts. Bed bugs have been living among humans for hundreds of years however they were eradicated back in the 1950's. Bed bugs showed resistance to some pesticides widely used in the past and that are no longer available. In the 1990's bed bugs began to re-merge worldwide due to an increase in international travel and commerce, lack of knowledge about preventing infestation, increase resistance to pesticides, and ineffective pest control practices.



Eggs about the size of a pinhead. Females need a blood meal to produce egg batches. A female bed bug can produce 3-5 eggs up to 12 eggs/day (over 200-400 in their lifetime). Bed bugs can produce from 3-6 generations per year.



They are small about 1/4 " in length. Bed bugs are about the size of an apple seed. Inmature stages are yellow to light tan color.



In the adult stage they are reddish- brown color and have no wings. The lifespan of a bed bugs is about 10 months.

Bed bugs have a Cryptic lifestyle (meaning they spend the majority of their time hiding together in cracks and crevices where they will not be seen or disturbed). Bed bugs are attracted to their host CO<sub>2</sub> produced by the host inhalations and body heat. Usually they aggregate near their host (i.e. beds, bed frames, head boards, and in clutter under beds). The following diagram shows the different five life stages of the common bed bug.

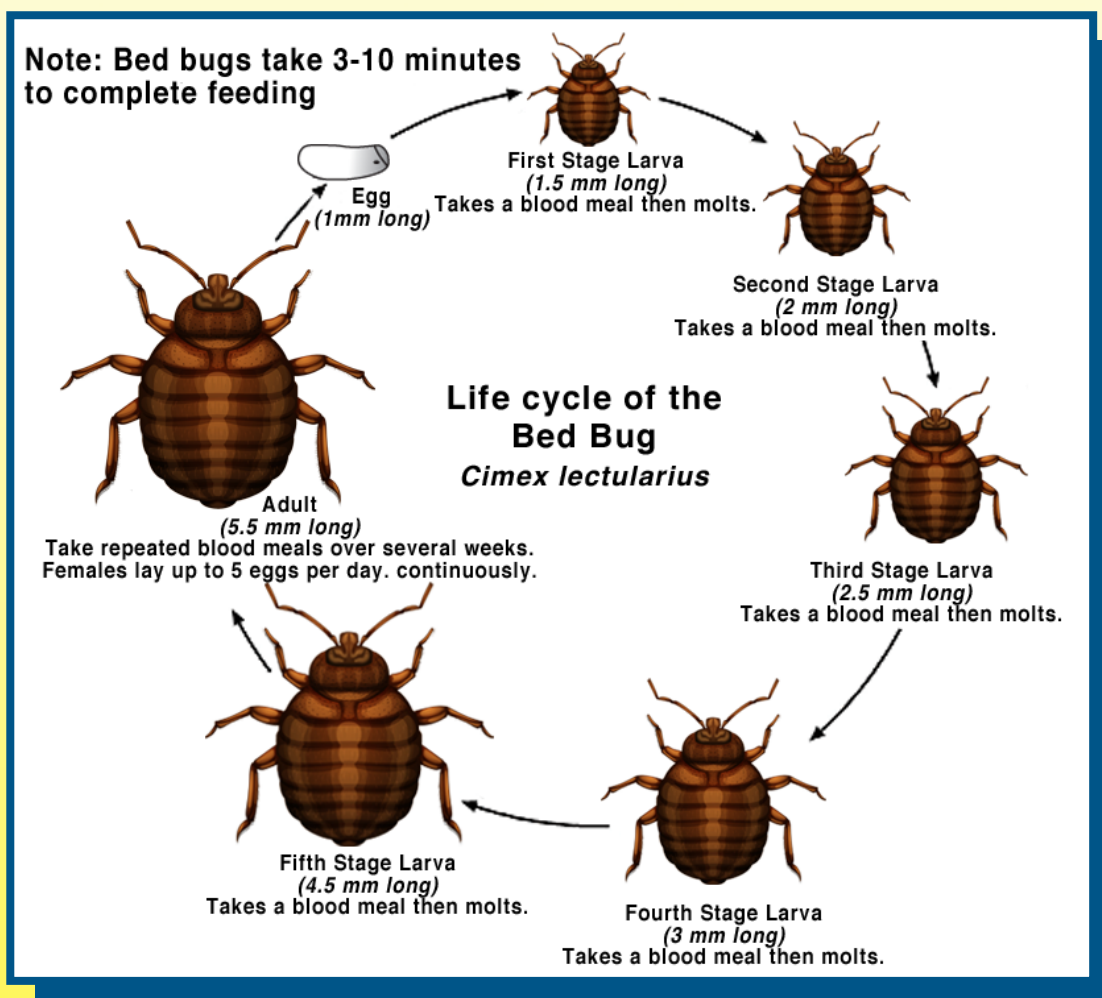


Photo credit: Texas A&M University

## B. BED BUG IDENTIFICATION:

### Bed Bug Identification:

- The first and most cost effective method of inspection is training any and all ALFs staff members to be able to recognize Bed Bugs activity.
- Encourage ALFs staff to be aware each time they are in a room of these signs (offer reward!).
- If ALFs staff identifies Bed Bugs presence they should immediately notify Management for further instructions.



### Signs and Symptoms:

- Bites on patients or guests.
- Blood spots and smears on linens and mattresses.
- Blood spots and smears on walls and ceilings.
- Brown fecal stains on linens, walls, corners and ceilings.
- Cast/shed skins.
- Look for Bed Bugs infestations at the following possible Bed Bugs harborage locations:
  1. Mattress
  2. Box Spring
  3. Bed frame and headboard.
  4. Baseboards around bedding and nightstands.



### Possible Bed Bugs Harborage Areas:

- Mattress
- Box Spring
- Bed frame and headboard
- Baseboards around bedding and nightstands
- Couches, chairs and other sitting and resting furniture
- Nightstands and dressers
- Closets
- Corners of walls and ceilings
- Durable medical equipment (i.e. wheel chairs and blood pressure equipment)



### C. INSPECTION METHODS:

#### Visual Inspection:

Should be done by a Pest Management Professional (PMP), unless activity is found, inspection time will vary depending upon the size of unit.

#### Canine Inspection:

These inspections can be more thorough and faster than human inspection as dogs are able to detect scent from eggs and small infestations that humans could easily miss.

A visual inspection to verify is often part of this service, or the use of two different dogs.



For further Bed Bugs Inspection information see appendix 1.



#### D. MONITORING PRACTICES:

Monitoring practices vary within active monitors and inactive monitors.

- **Inactive Monitoring-** The use of glue boards in areas likely to have bed bug activity is somewhat effective and has minimal cost. Placing in areas such as employee lockers, behind headboards and night stands may provide some assistance. Other means of inactive monitoring include products that allow bed bugs to climb up and into a trap that they cannot climb out of. These are most commonly placed under bed legs. These are often referred to as moat style.



- **Active Monitoring Devices-** These devices use an attractant to the bed bug that could be heat, CO<sup>2</sup>, chemical lures or any combination of these. Active monitoring devices can be as simple as moat styled devices with dry ice at the center to large traps that use a cylinder to emit CO<sup>2</sup> over days along with heat from a power source. Most devices are best in unoccupied settings, but some will function in occupied areas.



#### E. RECOMMENDED PREVENTION PRACTICES:

Bed bug introduction to un-infested environments can be prevented. The key to bed bug prevention is education thus raising awareness on how to reduce bed bug introduction into ALFs. A successful bed bugs awareness and educational approach must focus on the education of ALF's staff, residents and visitors (i.e. families).

## Recommendations for the ALFs to reduce bed bugs infestations:

- During residents intake interviews it is recommended to ask questions related to unexplained bite marks and infestation at prior facilities or residence.
- Launder patient clothing with high heat on dry cycle if any suspicion of infestation exists.
- Tell health care providers entering your facility and consider an inspection of equipment brought in.
- Regular canine inspections of rooms, laundry and staff areas (lockers).

After bed bugs are found **containing the infestation is priority!**

These are some recommendations for containing infestations:

- 1) Limit access to room.
- 2) Anything removed should be sealed in plastic.
- 3) Any clothing being moved should be laundered with high heat drying.
- 4) Inspect common areas and other rooms that resident frequents:
  - a. Bridge Club
  - b. Bible Study
  - c. Library / Computer Room
  - d. Bingo
  - e. Durable medical equipment storage room (i.e. wheel chairs storage room)
- 5) Inspect all bedding and furniture before installing into facility.
- 6) Treat with heat or put in dryer all luggages, pillows, shoes, slippers and clothing of new patients.
- 7) Inspect all personal belongings before placing in patient's room.



- 8) Examine all new patients for bites before admitting into their room and report immediately any indications of bed bug activity or signs to management.
- 9) Keep all bedding separate and sealed in heavy plastic bags if activity or signs are found in a patient's room.

## F. CONTROL METHODS:

### Non-chemical approach:

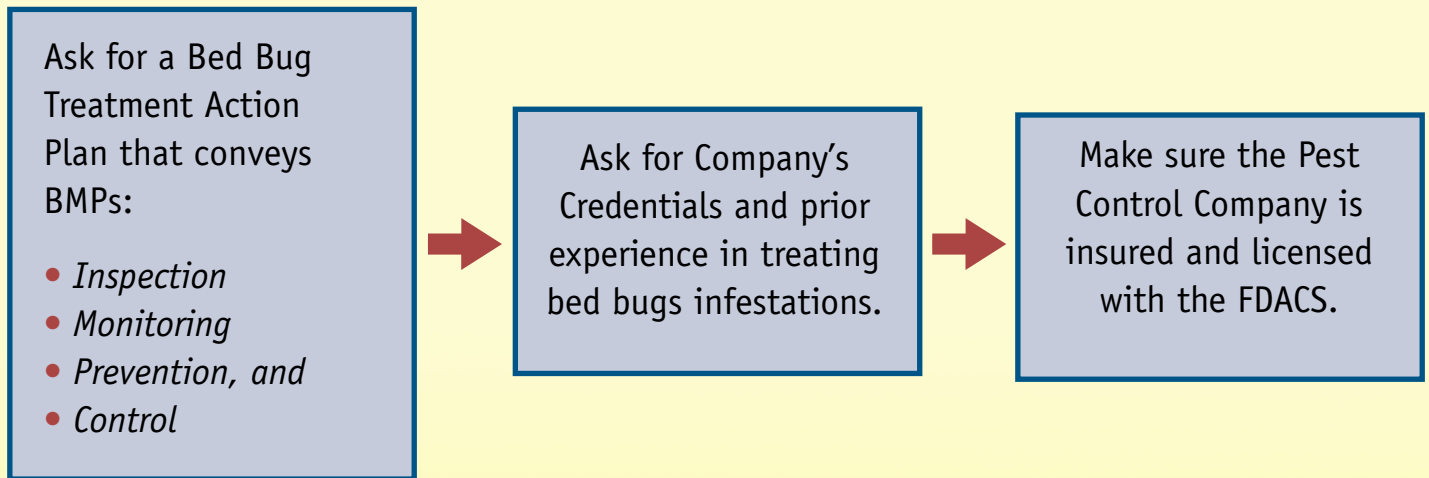
- Put bedding and clothing in the dryer at high temperatures to kill bed bugs.
- Heat infested articles and/or areas to at least 113 °F (45 °C) for 1 hour. The higher the temperature, the shorter the time needed to kill bed bugs at all life stages. Heat treatment methods can include steam, clothes dryer, portable heating devices and heat chamber.
- Cold treatments (below 0°F (-19°C) for at least 4 days) can eliminate some infestations. Again, the cooler the temperatures, the less time needed to kill bed bugs. Home freezers usually are not cold enough or reliably kill bed bugs.
- Use mattress, box springs and pillow encasements to trap bed bugs and help detect infestations.



### Chemical approach:

- Use a comprehensive strategy such as Integrated Pest Management (IPM) for controlling bed bugs. An adequate bed bugs IPM must combine bed bug life cycle information and chemical and/or non-chemical approaches. These approaches enable the management of bed bugs by combining common sense practices that provide the most economical means with the least possible hazard to pesticides.

**G. HIRING A PEST CONTROL COMPANY-** When hiring/contracting the services of a pest control company, the company should provide with an adequate bed bug treatment action plan.



#### a. How to select Pest Services Wisely:

Your first contact with a pest control company will normally be through a salesperson. Regulations prohibit misleading a consumer with fraudulent reporting of infestations. However, consumer must still purchase pest control services wisely and understand what they are contracting for.

#### TIPS for selecting a company

- Shop around for the best service at a reasonable price.
- If you do not know how to recognize insect infestation or damage, ask the salesperson to show it to you. He must have evidence to recommend a treatment.
- Have the salesperson disclose, in writing, that the premise or structure is infested with describe the pest location and what treatment services they will perform (in detail).
- For a work, a copy of the written **Bed Bug Treatment Action Plan** tha coveys BMPs, must be provided to you in advance, so that you can rea it completely and compare it

with other company's services. Ask the salesperson to explain any parts that you do not understand.

- Get opinions from two or more pest control firms to confirm the salesperson's diagnosis and pricing, particularly on an expensive or extensive treatment.

#### **H. BED BUG PRE-TREATMENT PREPARATION:**

The key to successful bed bug control extermination is proper pre-treatment preparation. Pest control technicians must be able to have easy access to possible bed bug harborage areas such as cracks and crevices, and other bed bug infested areas. Some advantages of proper pre-treatment preparation are:



Pre-  
Treatment  
Advantages



- Treatment effectiveness assurance
- Minimizes treatment time
- Secures applicable treatment warranty
- Increases overall customer satisfaction

The hired company should recommend Pre-treatment Preparation Instructions regarding how to adequately prepare the ALF prior to each bed bug treatment. It is important that ALFs management follow these instructions to achieve best treatment results. These instructions may be customized to their specific bed bug treatment strategies or approach.



## General Bed Bugs Pre-Treatment Instructions may include:

- The actual treatment scheduling date and due date and time for preparations to be completed.
- A request to make arrangement for people and any living things (i.e. plants and pets) to be off the ALF during the bed bug treatment. There should be an intake plan in place if you are moving people from one facility to another facility.
- Laundering instructions- Wash and dry all clothes in dresser drawers and closets, curtains linens, pillow cases, comforters, and towels for 30 minutes minimum. Placing all clean clothing in trash bags, air tight containers or garment protectors and leave in center of room or in bathtub.
- Vacuuming instructions- Inspect and vacuum all items thoroughly- (throwing away vacuum bag and/or replacing filter). Vacuum mattresses, box springs, floors, sofas and cushions, etc.
- A request to:
  - ◆ Disassemble all furniture- Remove drawers from dressers and nightstands and remove items from the walls.
  - ◆ Not to stack belongings on couches or beds- these may require treatment.
  - ◆ Unplug and cover all electronics.
  - ◆ Remove or organize clutter.
  - ◆ Install mattress encasements.
- Specific post-treatment instructions necessary to achieve desired results.



## **I. COMPLAINTS RESOLUTION:**

The FDACS, Bureau of Entomology and Pest Control regulates the structural pest control industry under Chapter 482, Florida Statutes and/or Chapter 5E-14, Florida Administrative Code.

The Bureau has no authority to adjudicate or arbitrate in disputes between consumers and pest control companies. Disagreeing parties must resolve disputes in civil court.

The Bureau will investigate any consumer complaint to determine if the pest control company is in compliance with our regulations.

Any violation noted by the inspector will be to the Bureau's headquarters, located in Tallahassee, where the evidence will be reviewed and, if appropriate, a determination is made regarding the issuance of an administrative action.

## J. APPENDICES:

- Appendix 1:

### Slide 1

## Researching Best Practices for Preventing, Detecting, and Controlling Bed Bugs

Ben Hottel  
University of Florida  
Department of Entomology and  
Nematology

### Slide 2

## Why are Bed Bug Inspections Important

- Small populations are easier to control than large



Large Infestation

VS



Small Infestation



### Slide 3

## Bed Bug Biology

- Feed on blood
  - Bats, poultry, and Humans
- Temporary Parasites



### Slide 4

## Inspections

- When performing a bed bug inspections it is important to know what a bed bug looks like



Bed Bug Nymphs

VS



Carpet Beetle Larva

Slide 5

## Inspections

- Correct identification is important!



Slide 6

## Inspections

- Correct identification is important!



Slide 7

## Bed Bug Identification

- Characteristics
  - Lack wings
  - Piercing/sucking mouthparts



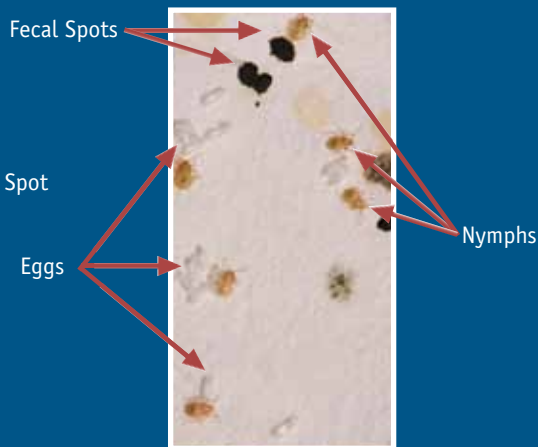
Slide 8

## Evidence of Bed Bugs

- look for
  - Physical presence
  - Cast Skins
  - Black Fecal Spots



Pic by Harold Harian



Pic by Richard Naylor

Slide 9

## Inspections

- But sometimes it's hard to find what you are looking for



Slide 10

## Inspections

- **Equipment Needed**
  - Flashlight
  - Gloves
  - Tyvek Suit



## Slide 11

### Inspections

- Inspections can be assisted by
  - Interceptor Traps
  - Canine Detection



## Slide 12

### Interceptor Traps

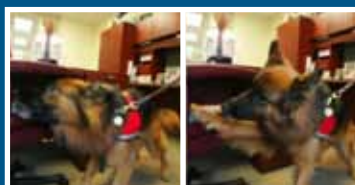
- Pitfall traps
- Smooth inner walls prevent escape
- Talc powder is sometimes added
- Use host as a lure



Slide 13

## Canine Scent Detection

- Correctly trained and handled canines found to be 98% accurate
- Examination of multiple companies found the dogs to be between 11 and 83% accurate
  - False positives 0 to 38%
- Canines can be effective but that have to be trained correctly



Slide 14

## Don't Use Dumb Dogs



Slide 15

## Canine Scent Detection

**BED BUG DETECTING CANINES IN ACTION**

Slide 16

## Harborage Characteristics

- Live in undisturbed locations
- Cracks and crevices around where a host rests
- Rough, dry, and provide at least some partial darkness
- Group together



Slide 17

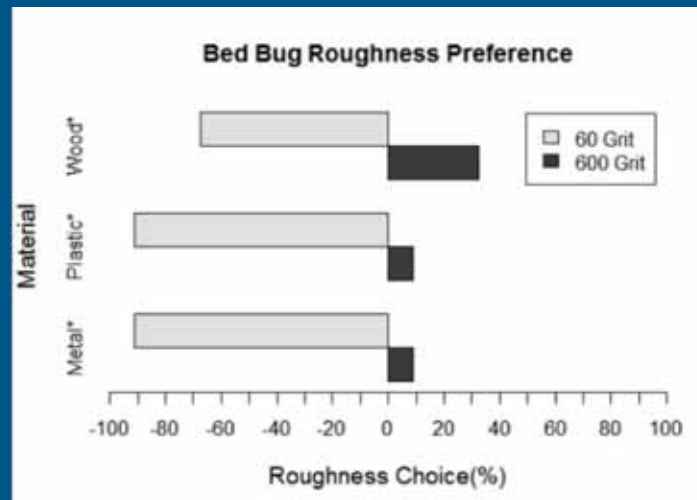
## Roughness Preference

- Tested
  - Copper
  - Basswood
  - Plexiglass
- One half sanded with 60 grit other half sanded with 600 grit sandpaper



Slide 18

## Roughness Preference





Slide 19

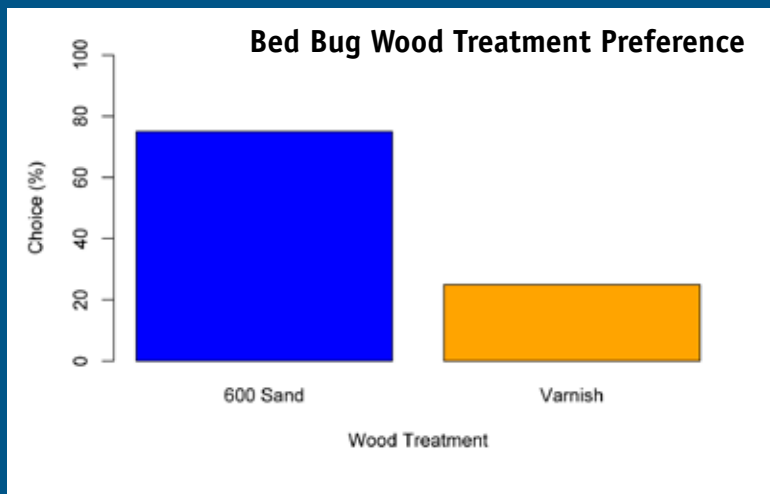
## Finished Wood Preference

- Tested
  - Varnished wood vs unvarnished wood
- Wood Sanded with 600 grit sandpaper
- One half varnished and let dry 129 days



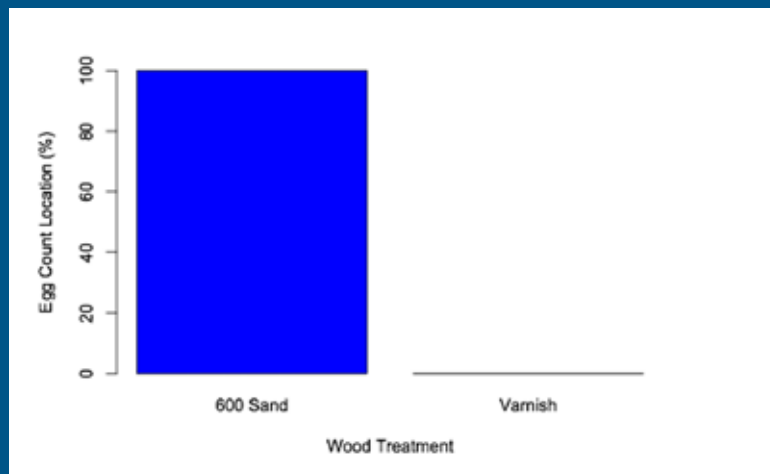
Slide 20

## Finished Wood Preference



Slide 21

## Location of Eggs



Slide 22

## Finished Wood Preference

- Need to check in unfinished areas of furniture



Slide 23

## How to Inspect a Room

- #1 Mattress/Box Spring
  - Check for fecal spots on sheets
  - Examine seams
  - Most likely on underside
  - Encasements make inspections easier



Slide 24

## What's Wrong Here?



He's on the bed!

Slide 25

## How to Inspect a Room

- #2 Bed Frame and Head board
  - Cracks and corners
  - Head board #1 place in hotels
- Vacuum up what you find



Slide 26

## How to Inspect a Room

- #3 Furniture near bed
  - Cracks and corners
  - Unfinished wood (rougher areas)



Slide 27

## How to Inspect a Room

- #4 Picture Frames
  - Back side
  - Corners and cracks
  - Seams



Slide 28

## How to Inspect a Room

- #5 Curtains
  - Pleats
  - Seams



Slide 29

## How to Inspect a Room

- #6 Kick Plates
  - Cracks and crevices



Slide 30

## How to Inspect a Room

- #7 Popcorn Ceiling
  - Wall ceiling juncture
  - Cracks and crevices in popcorn ceiling



## Slide 31

# How to Inspect a Room

- #8 Chairs and Sofas
  - Seams
  - Cracks and crevices
  - Unfinished wood areas



## Slide 32

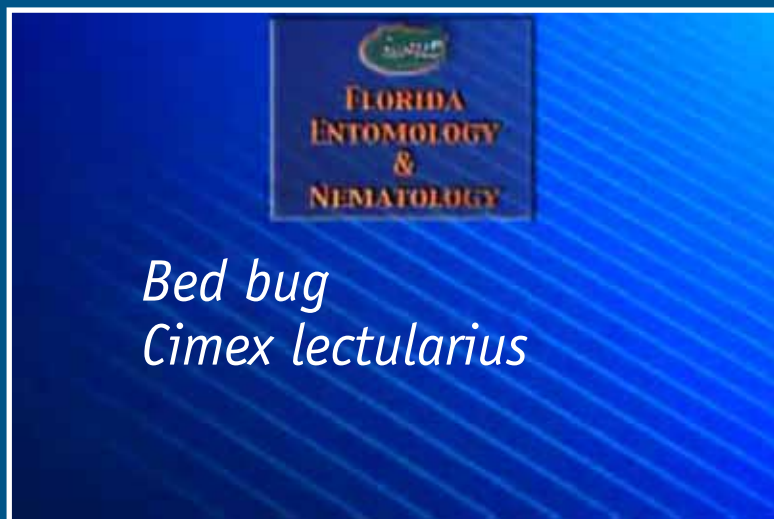
# How to Inspect a Room

- #1 Mattress/Box Spring
- #2 Bed Frame & Head Board
- #3 Furniture near bed
- #4 Picture Frames
- #5 Curtains
- #6 Kick Plates
- #7 Popcorn Ceilings
- #8 Chairs and Sofas



Slide 33

## How to Inspect a Room



Slide 34

## How to Inspect a Room

- **Control Options**

- Vacuum bed bugs
  - Dispose of bag immediately after use
- Interceptor traps
- Mattress and box springs encasements
- Clothes and bedding can be placed in dryer
- Call a pest management professional

- **If you have questions, contact:**

Ben Hottel  
bhottel@ufl.edu





