

BED BUGS

Bureau of Health Care Quality and Compliance

Vincent Valiente

Bed Bugs Overview

- External parasitic insect
- Mainly active at night
- Feed on the blood of warm blooded sources, mainly humans
- Fast moving
- More active in warmer climates
- Can live for 10 – 20 months
- Other warm blooded victims of bed bugs:
 - Dogs, Cats, Birds, Rodents, and Bats

Bed Bugs Overview

- Endure long periods of starvation
- Excellent hitchhikers
- Tend to stay close to food sources but can live in a variety of objects
- Infestations are not always linked to unclean conditions
- The recent influx has hit everywhere, including healthcare facilities, hotels, houses, schools, apartments, public transit, etc.

Today's objectives

- History
- Recent resurgence
- Identification
- Habits
- Bite recognition
- Health risk
- Inspecting
- Prevention, control, and elimination

Historical evidence

- Bed bugs have been around for thousands of years
- In the US, evidence has dated back to the 17th century during early colonization from Europe
- Infestations were common in the United States prior to World War II



Early prevention and control

- After World War II, widespread use of synthetic insecticides such as DDT greatly reduced bed bug numbers
- In addition, household cleanliness and increased regulation of the used furniture market added to the drastic reduction

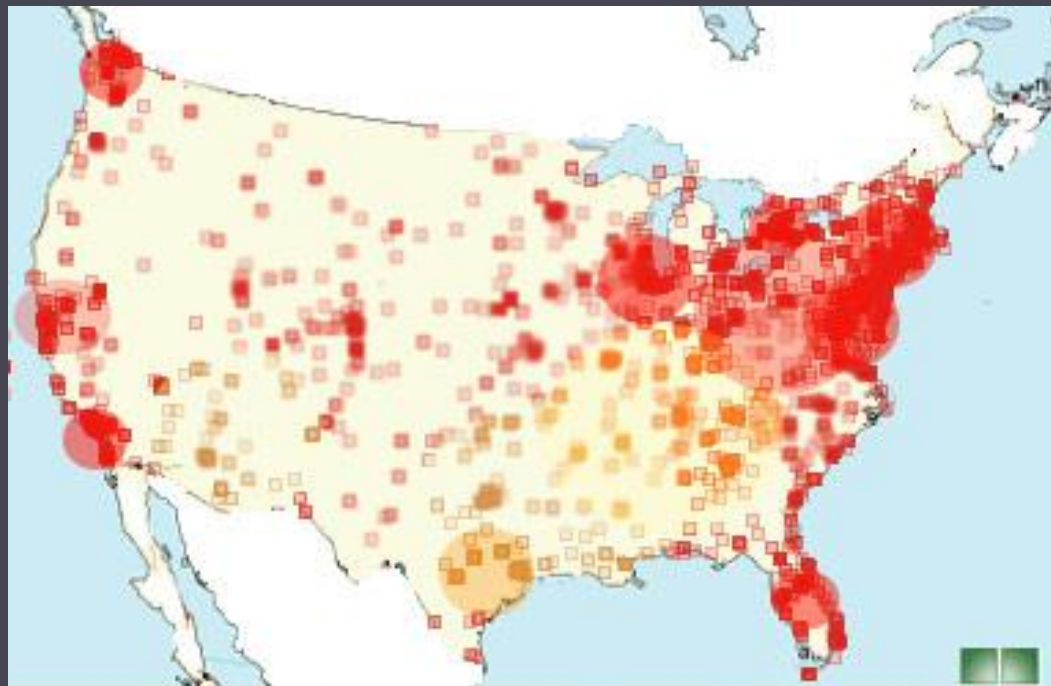


Recent resurgence

- Until about 10 years ago, bed bugs were a distant thought
- In the last decade, they've been making a comeback of epidemic proportions
- Bed bug complaints to pest control companies increased by 500% in the U.S. between 2000 and 2004. (National Geographic News)

Recent resurgence

- Last year bed bug infestations were reported in every state in the U.S., and reports are increasing exponentially.



2010 Bed Bug Reports



Recent resurgence

- According to the National Pest Management Association (NPMA):
 - 95% of pest control professionals reported treating bed bugs in the last year
 - One company alone in the first quarter of 2011 has performed 8,000 treatments across the country

Reasons for resurgence

- Pesticide bans
- Pesticide misuse
- Insect resistance
- Baits instead of current approved pesticides
- Travel and commerce
- Decreased public awareness

Identification: Species

Tropical bed bug
Moderately excavated



Bed bug
Deeply excavated



Identification: Size and shape

- Mature: ~1/8 – 1/4 inch long
- Immature: less than 1/10 of an inch
- Bed bugs can have two different oval shapes:
 - Flat when unfed
 - Swollen after feeding



Identification: Color

- Immature:
 - Almost completely transparent when unfed
 - Light red after feeding
- Mature adults: different shades of brown fed and unfed



Identification: Development



- Eggs

- Approx. 1mm long
- Laid in batches of 5 – 15/day
- A female can be responsible for 200 - 500 eggs
- Eggs are very sticky
- Eggs hatch at a rate of 6 – 17 days



Photo Credit: James Kalisch, UNL Dept of Entomology



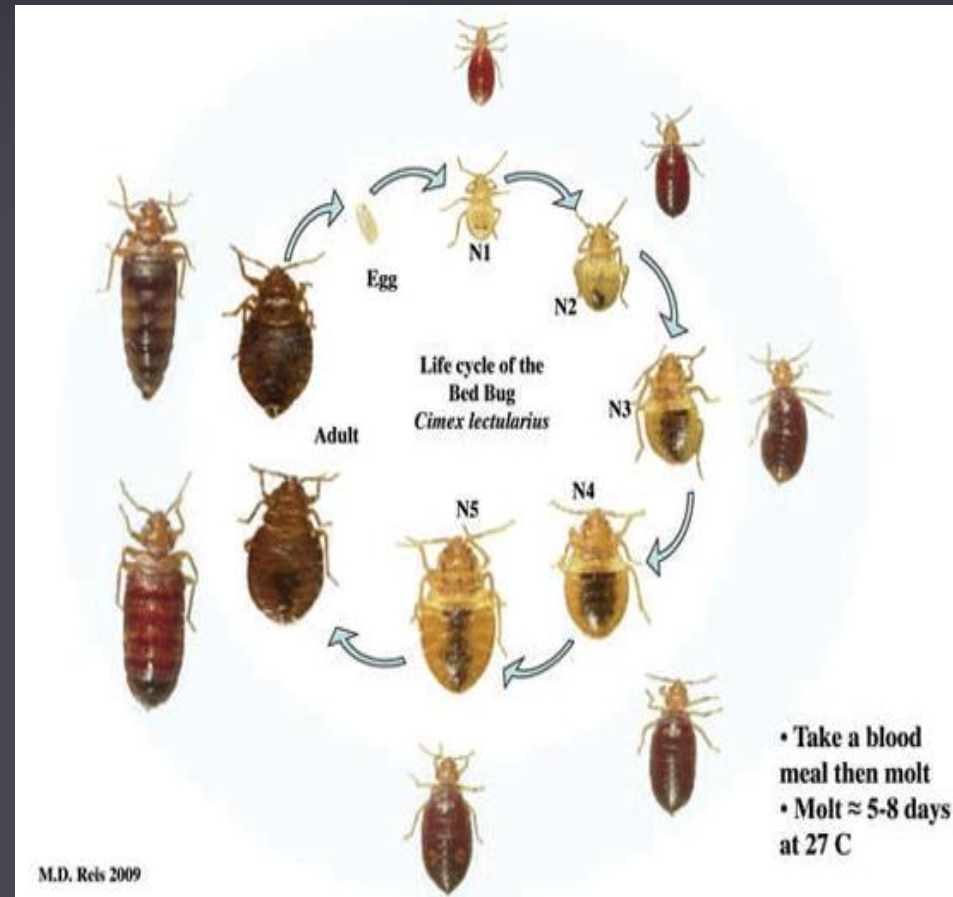
Photo Credit: James Kalisch, UNL Dept of Entomology



Phil Pellitteri, University of Wisconsin
Department of Entomology

Identification: Life cycle

- 5 nymph stages to reach full maturity
- Molt after each meal
- Molt 5 times before adulthood
- Growth is complete after 4 – 7 weeks
- Growth rate is dependent on environmental conditions



Identification:

Life cycle

- Bed bugs can live for a long time!
- Some studies suggest 10 – 20 month life span
- There's evidence of bed bugs surviving up to one year in starvation mode



Habits

- Unable to fly, jump, or burrow into skin
- Bed bugs move by crawling
- Adults crawl up to 4 feet /min
- Hide in cracks and crevices, often in groups
- Prefer fabric, wood, and paper surfaces

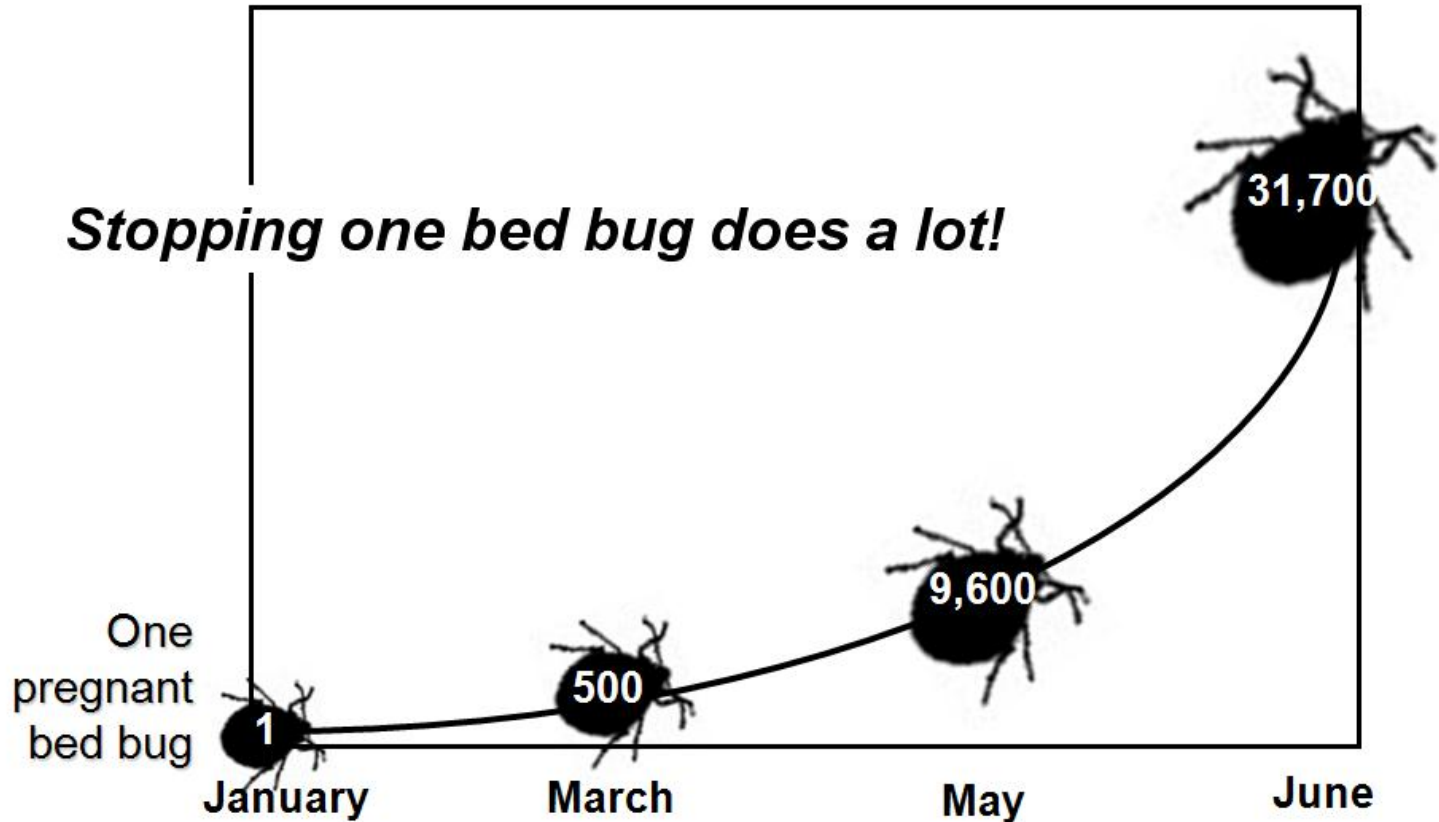


Habits: Mating

- Bed bugs breed by traumatic insemination
- After mating and feeding, females are ready to lay eggs



Habits: Mating



Habits: Feeding



- Blood feeders
- Typically at nighttime
- Usually 1-2 hours before sunrise
- If given the chance, bed bugs will feed during the day
- Do not feed everyday and can endure long periods of starvation

Habits: Feeding

- Attracted by warmth and CO₂
- Penetrate the skin with two hollow injector tubes
 - One tube for injecting saliva
 - The other tube for withdrawing blood
- After feeding for approx. 5 – 15 minutes, the bed bug returns to a hiding place



Bite identification

- Similar to other insects
- Isolated cases are difficult to confirm
 - Initial bite is painless
 - Reactions are dependent on the individual
 - Swelling
 - Welts
 - Severe itching
- It may take up to 14 days for a reaction to develop at the bite site
- In order to verify a bed bug problem you must find further evidence in addition to the bites

Bite identification

- Typically no red center spot
- Bed bugs tend to focus on exposed skin
- Rarely occur on palms or soles
- Often occur in rows and/or groups



Bite identification



Bite identification



Bite identification



From Ross, Bed Bugs
BadSpiderBites.com



Health risk

- Common physical and mental health effects:
 - Sleeplessness
 - Agitation
 - Anxiety
 - Emotional Stress
- No conclusive evidence of disease transmission



Health risk

- Possible Vectors?
- >20 pathogens have been found in bed bug guts
 - According to the Mayo Clinic (mayoclinic.com), by feeding on infected people, bedbugs can be infected with some bloodborne diseases.
- In addition, the trauma from bites can lead to secondary infections especially when it happens in highly susceptible populations.
- Researchers in British Columbia, Canada recently found MRSA and VRE infected bed bugs in homeless shelter

Health Risk

- To avoid secondary infections please contact your medical physician!



Inspection

- Hide in dark and protected sites
- Prefer fabric, wood, and paper surfaces
 - Mattress , box springs, and bed frame
 - Furniture
 - Cracks and crevices including
 - Baseboards and carpets
 - Window frames and door frames
 - Outlets and switch plates
 - Drapes
 - ETC.!!!!

Inspection tools

- Tools for finding bed bugs

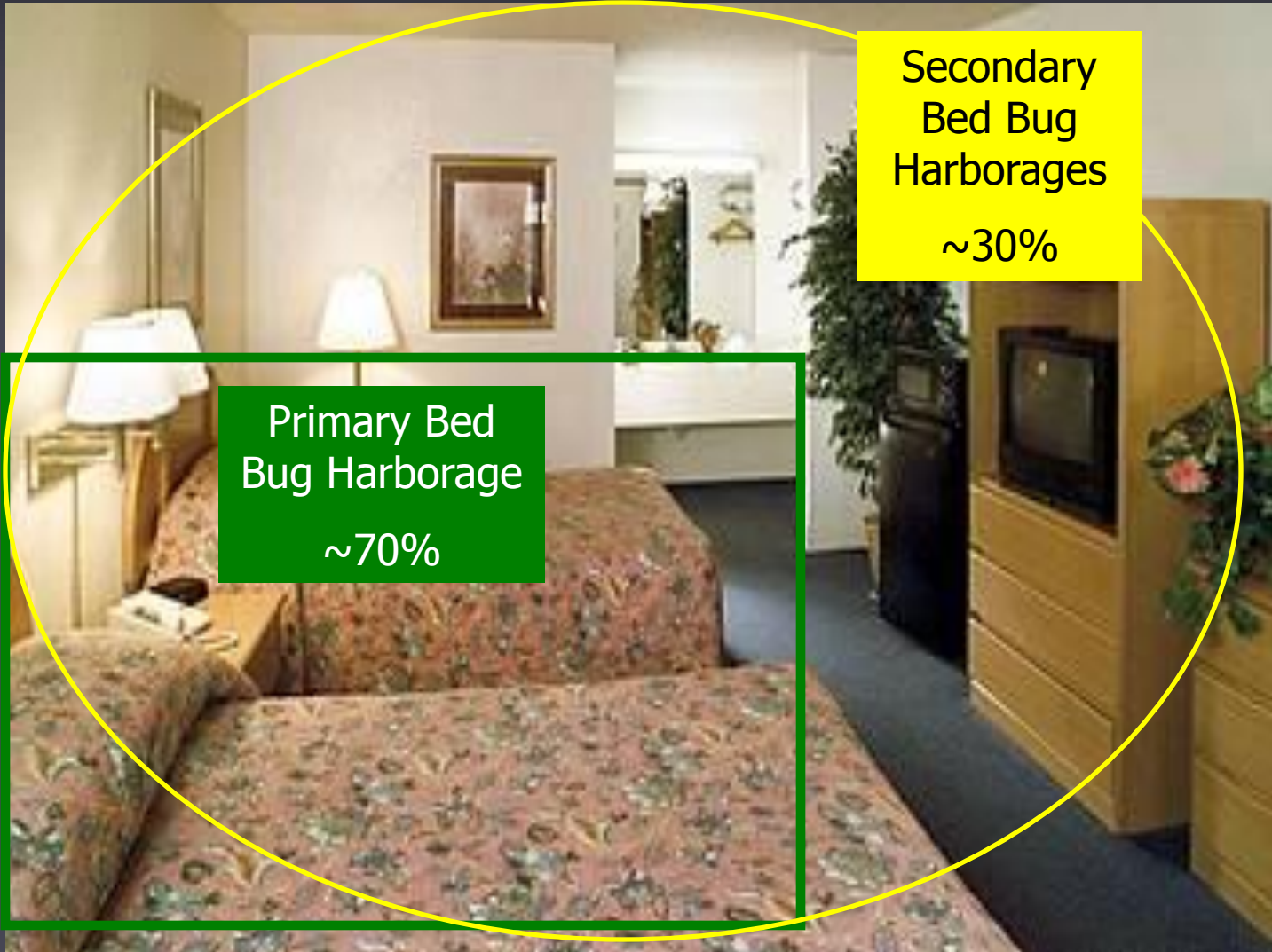


Inspection

- Bed bug inspections are tedious and can take 1-2 hours for a standard size room
- Bed bugs are exceedingly wary and cautious which is recognized through their ability to avoid detection



Inspection



Secondary
Bed Bug
Harborages

~30%

Primary Bed
Bug Harborage

~70%

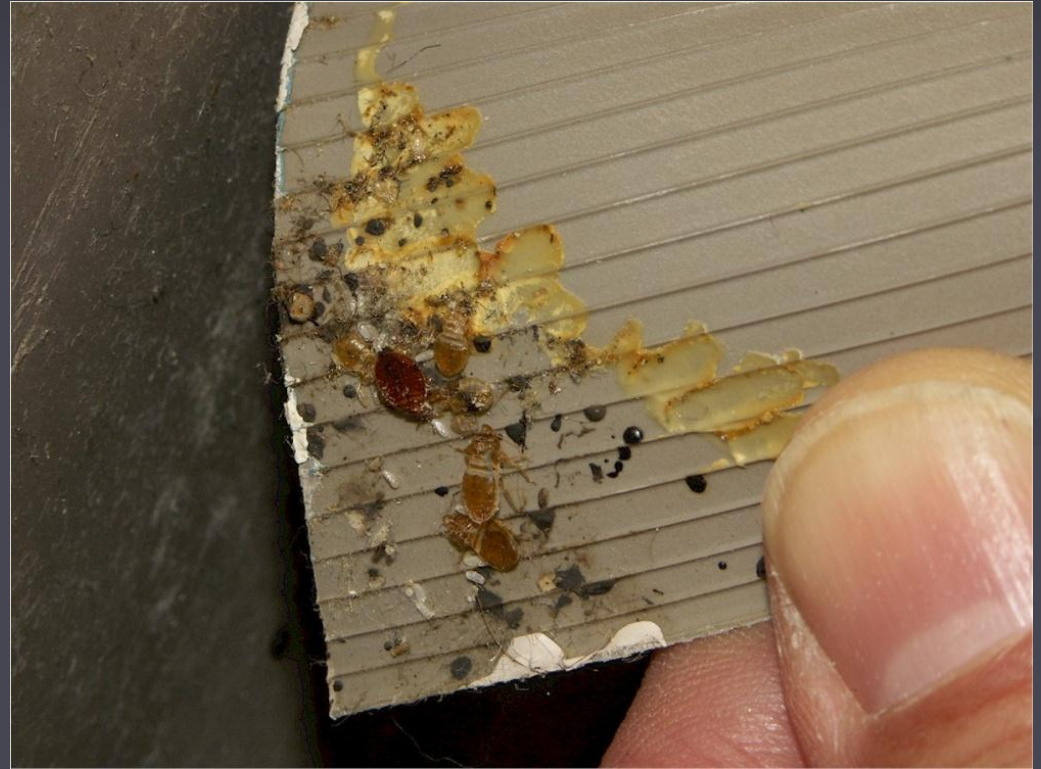
Inspection: Beds and box springs



Inspection: Other furniture



Inspection: Baseboards and carpets



Inspection: Outlets and wallpaper



Inspection: Drapes, ETC!!



Prevention

- Recognize the signs
- Welts on exposed skin of your residents
- Black fecal spots
- Skin sheds and eggshells
- Live BUGS!
- Blood stains from crushed bugs
- Sweet or musty odor in severe infestations



Prevention

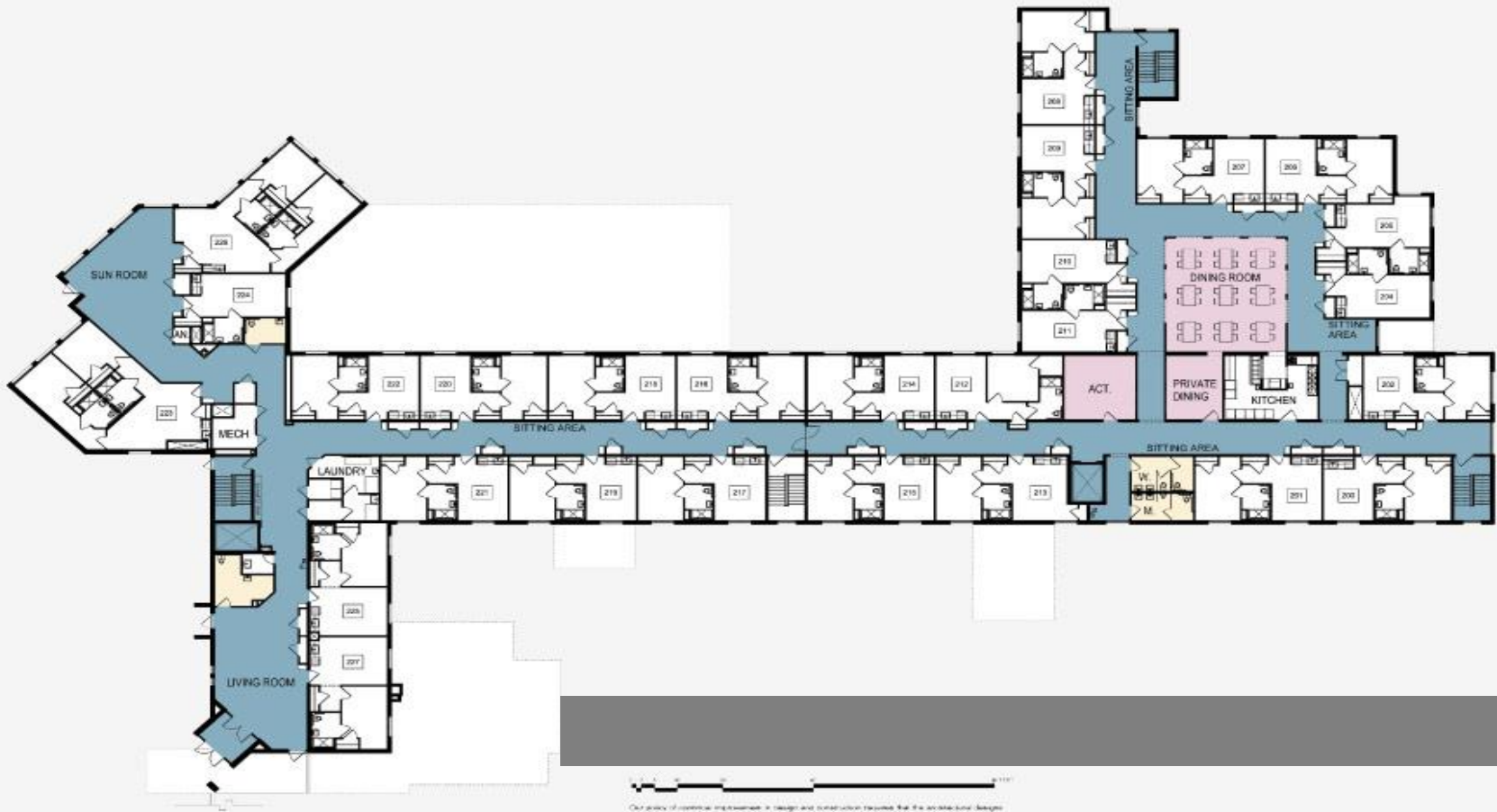
Reduce the risk of an infestation!

Eliminate Clutter



Prevention

Stop the spread!



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Control and elimination

- If untreated, the problem will become much worse!!
- A bed bug infestation will not go away on its own!!
- The first step is to correctly identify the problem
- Preparation is the key to success in eliminating bed bugs
- Start with thorough cleaning
- Assume all clutter is infested



Control and elimination



Control and elimination

Types of treatments

- Non-chemical
 - Vacuum
 - Steam
 - Mattress encasements
 - Traps
 - Mechanical Drying
- Chemical
 - Must be done by a professional!
 - Dust
 - Sprays
 - Fumigants

Control and elimination

- Your responsibilities after you find bed bugs:
 - Start with a thorough cleaning
 - Do not remove and/or discard furniture
 - Wash all linens and clothing in hot water >120F
 - Dry all linens and clothing on high heat
 - Items not suitable for extensive cleaning can be contained in plastic bags and placed outside in the heat
 - Repair all cracks and crevices in living areas

Control and elimination: Vacuuming

- A very effective way to reduce large numbers of bed bugs quickly
- Use a vacuum that empties into a vacuum bag instead of a filter
- Avoid using vacuum attachments that have brushes or bristles
- The vacuum bag should be tied shut in a trash bag and discarded outside of the home
- Change bags between task!



Control and elimination: Steam

- Steam cleaning can be very effective
- Please consult your pest control company before using steam as a treatment method
 - Type of steamer to use
 - Mold potential
 - Research what can and cannot be steam cleaned
 - PPE
 - You may clean away or render useless pesticide and dust treatments that have already been applied

Control and elimination: Mattress

- The bed is stripped, cleaned, and all bedding washed.
- Place pillows in the dryer. The heat will kill all stages of bedbugs



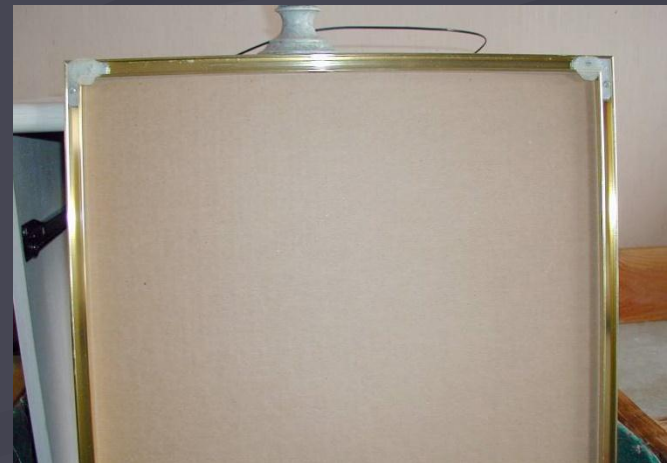
Control and elimination:

Mattress encasements

- A good encasement should:
 - Keep bed bugs in and away from you
 - Keep bed bugs from infesting a new mattress or box spring
 - Confirms new bed bug activity outside of the encasement
 - Can be use to starve bed bugs

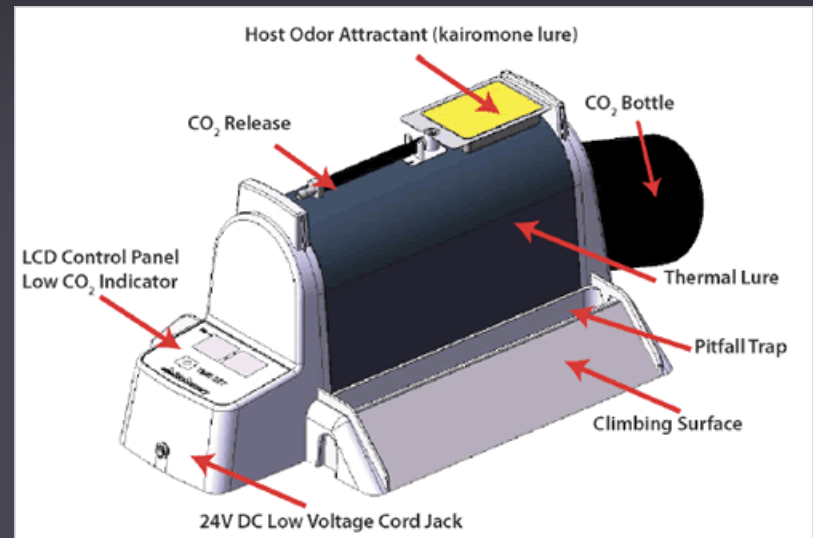


Control and elimination



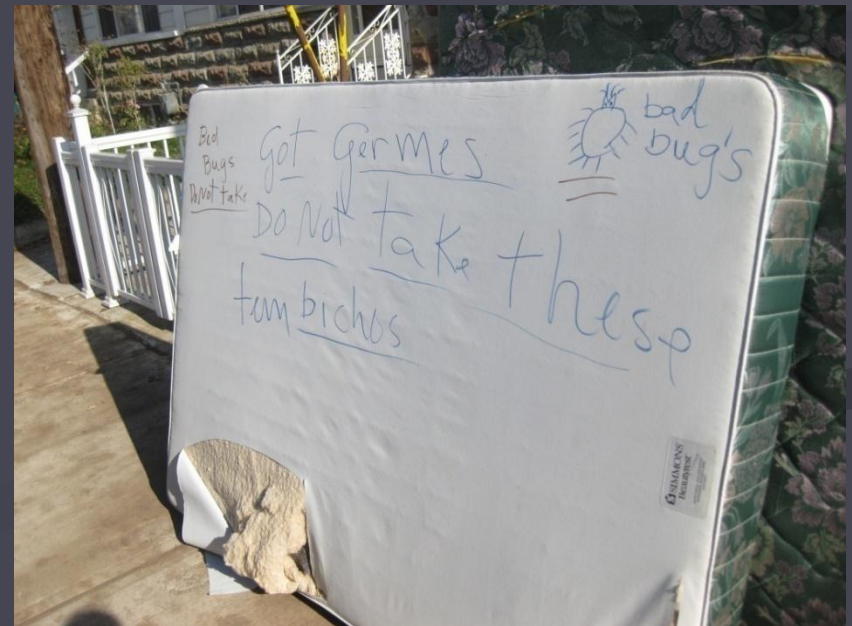
Control and elimination: Traps

Will not eliminate the
problem!!!!



Control and elimination

- Discarding and/or removing infested items
- Contain item before removing from infested area
- Please label all infested items!!!



Control and elimination: Chemical treatments

- Chemical treatment is a crucial step to eliminating bed bugs
- These types of treatments require careful application and safety measures
- Misuse can have severe adverse effects
- TO AVOID TOXICITY, CONTACT A LOCAL PEST CONTROL PROFESSIONAL



Summary

- Most importantly, increase awareness!
- Infestation can arise quickly
- Recognize the signs
- Health effects and secondary infections
- Inspect with a cause
- Habitually conduct good sanitation practices
- Perform non-chemical procedures
- STOP! Leave the chemical treatment work to the professionals!!

Questions?



YES, OUR GOOD
FRIENDS ARE ON THE
FRONT LINES!!

Link and contact info

Where to find this presentation:

<http://health.nv.gov/HCQC.htm>

Right hand side, underneath workshop info

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