

Bed Bugs: What You Should Know?

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This presentation is part of a bed bug educational program sponsored by U.S. Environmental Protection Agency. The purpose is to provide multi-dwelling building staff and managers with basic information on bed bugs and their control. Staff can use the knowledge gained from this presentation and other accompanying materials to educate their peers and residents in the prevention and control of bed bugs.



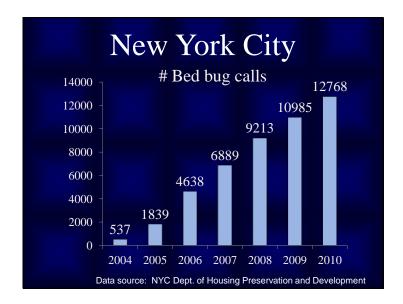
As you may be aware, bed bugs were once a way of life here in the U.S. That is until shortly after that WWII era when they were virtually eradicated using chemicals and methods that would not be permitted in today's society.



But in the late 1990s bed bugs started showing up again more frequently, mostly in hotels and motels throughout the country



It didn't take long before they spread into the residential sector where the multifamily housing industry was especially hard hit. They are also a common problem in university housing and even private homes in middle and upper class neighborhoods



Recognizing that bed bugs were becoming more prevalent, NYC's Department of Housing Preservation and Development began to track reports of bed bugs, and as you can see since 2004 the bed bug activity in NY has been increasing at an alarming rate, with calls to the HPD increasing from just 537 in 2004 to nearly 13,000 in 2010.

But bed bugs are not limited to NYC, nor are they limited to large cities, in fact they are showing up in cities and rural towns in all 50 states.

And because they are such good hitchhikers they have...

Now bed bugs are found everywhere

- Hotels & motels
- Apartments
- Private homes
- College dorm rooms
- Schools and day care
- Used furniture outlets
- Furniture rental stores
- Moving/delivery vans
- Health care facilities
- Nursing homes

- Churches
- Airplanes & cruise ships
- Public transportation
- Laundries & dry cleaners
- Movie theaters
- Fire stations
- Youth hostels
- Jails

...And because they are such good hitchhikers they have spread from infested residential settings out into the community and are now being found just about everywhere. So when you look at this list instead of asking "Where are bed bugs found?" It may be more appropriate to ask "Where aren't we seeing them?" because they can be found virtually anywhere.

What caused resurgence of bed bugs?

- Loss of effective pesticides (i.e. DDT)
- Resistance to insecticides
- Changes in pest control practices (targeted versus broad spectrum treatments)
- Frequent travel to and from areas where bed bugs are prevalent

So what caused the resurgence of bed bugs in the US?

Nobody knows for sure why bed bugs are back but the most commonly accepted theory is that it is combination of factors that together, enabled bed bugs to regain a foot hold.

First pesticides that were highly effective in the past, like DDT and the organophosphates are no longer available and many of the chemicals that are currently available not very effective as bed bugs have developed high levels of resistance to many of them.

We have also changed the way we apply pesticides. In the past it was common to treat the baseboards of apartments once per month with liquid residual sprays for pests like cockroaches, but that has been replaced with very targeted applications of baits which have no effect on bed bugs.

With the various pressures from pesticides lifted the stage was set for the successful establishment of bed bugs that were introduced into the country during travel to and from parts of the world where bed bugs are more prevalent.

Factors that promote spread

- 1. Lack of education and public awareness (introduction, reintroduction)
- 2. Not detected quickly enough
- 3. Infestations controlled but not eliminated
- 4. Reactionary approach rather than pro-active community wide approach.

And once bbs are introduced, they often spread quickly throughout communities for a variety of reasons.

First, there is still a general lack of education and public awareness about bed bugs. Despite the fact that everyone knows bed bugs are a problem, many people still don't understand how to avoid introducing them into their homes or how to recognize the signs and symptoms of bed bugs.

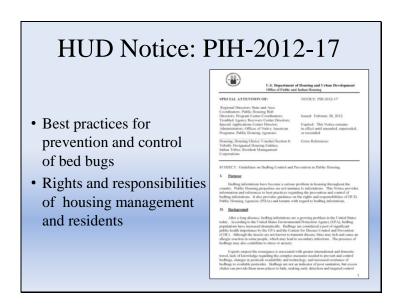
And because people are not familiar enough with bed bugs, they often fail to detect them quickly enough allowing infestations to become well established and to continue to spread.

In addition it is very difficult and expensive to completely eradicate an infestation, so often populations are reduced to very low levels but fall short of elimination which in turn promotes population rebound and further spread.

And within multi-family communities bed bugs are often handled on a reactionary basis, rather than proactively at the community level.

As a result when bed bugs are introduced they are often not detected quickly enough and populations become very well established making them much more difficult and costly to eliminate and promoting the continued spread of bed bugs throughout our communities.

Once infestations have been identified and reported they can be very difficult and expensive to eradicate, so many infestations are reduced to very low numbers but are not necessarily eliminated, which then sets the stage for a population rebound.\



Recognizing the growing problems that bed bug present in multifamily housing, the U.S. Dept. of Housing and Urban Development recently published guidelines for the prevention and control of bbs in public housing.

This document provides information on best practices in bb management and outlines the responsibilities of housing management as well as the rights of residents.

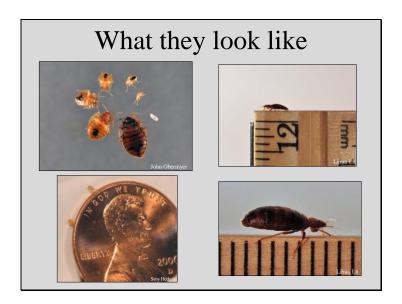
Regardless whether bb infestations are present in your facility, it is important to educate yourself and others about bbs. This knowledge will help you make sound decisions in selecting the most economical, safe and effective methods for the management of bed bugs

A few basic facts Feed exclusively on blood Do not feed every day, seek a blood meal once every week or so Can survive many months without feeding Lay 1-3 eggs each day (hatch in 7-10 days) Nocturnal & very secretive

So I would like to start by reviewing some basic facts regarding bed bugs.

What you are looking at here is the first stage immature bed bug that is fully engorged with blood.

- Bed bugs feed exclusively on blood which they require for development as well as reproduction.
- But they don't feed every day. Individual bed bugs may only feed once every week or so. This has a significant implications, because It means that only a fraction of the population will be exposed to treatment efforts the day the application was made, many will not encounter the treated surfaces until they leave their hiding places to seek a blood meal days later, when many of our materials are not nearly as effective.
- Bed bugs are also very resilient and can survive many months without a blood meal.
 This can result in big problems if an infested unit is vacated because once the host is
 no longer present it will promote dispersal of bugs to surrounding units and live bed
 bugs are most likely to still be present when it is re-occupied by a resident.
- They are also very prolific. Adult females lay between 3-5 eggs every day. The eggs are a well protected stage and don't hatch for 7-10 days. So it is important to realize that following the initial treatment eggs that were missed will continue to hatch over the next week or so new bugs will be entering the environment looking for a blood meal.
- And finally their nocturnal & secretive behavior can make them difficult to locate and control



In the previous slide you saw what the engorged first stage nymphs look like but when bed bugs are unfed they are flattened, wingless insects that cannot fly or jump. They are straw colored at the youngest stage, reddish brown at the adult stage. Before feeding, the adults are about the size of an apple seed, while the juvenile stages can be as small as a pin head. After feeding, they become swollen, and change to dark red color as they fill with blood.

Feeding

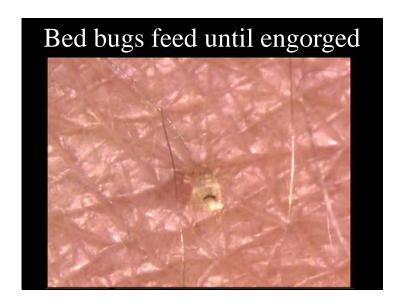
- Usually feed at night while you are sleeping
- Hungry bed bugs will feed any time
- A blood meal takes 3-10 minutes
 - May change feeding sites on same person during one meal
- Digested blood is excreted as black or brown fecal spots





As already mentioned, bed bugs feed exclusively on blood. They typically feed at night while people are fast asleep. The bites are painless so the person often has no idea that they have been fed upon. However, they will feed at any time of day or night depending upon when their blood meal is available and how much competition there is from other bugs in very large infestations.

It takes anywhere from 3-10 minutes for bed bugs to become fully engorged with blood and they may feed change their feeding sites while feeding the same host. As a result, a single bug can cause more than one bite reaction so the number of welts does not necessarily correspond to the number of bugs that fed.



This time lapse video shows a young bb feeding on a human volunteer. You will begin to see the bed bug use a pumping action in its head to draw up the blood. Keep in mind this is a time lapse video that was taken over a number of minutes. You can see that the bug will continue to feed until it becomes swollen. It almost looks like it is about to burst and then it withdraws its mouthparts and scurries back to its secretive hiding place where it will remain digest the blood meal in order to develop to the next stage or reproduce depending upon its sex and developmental stage.



Because bed bugs feed on human blood there is obviously concern regarding disease transmission. Fortunately, bed bugs have never been demonstrated to transmit diseases directly through their blood feeding activity and thus are not considered a vector of disease.

However because they do feed on blood people can develop bite symptoms and the emotional impact that accompany bed bugs can be significant. For these reasons while bed bugs may not be a disease vector they are still considered a pest of public health importance.

Reactions to bites can vary quite a bit from one individual to the next.

Some people exhibit delayed reactions of several days to a week or more, while other people never react at all, this is especially common among the elderly. Failure to develop bite symptoms coupled with the small size and secretive nocturnal behavior of bed bugs can result in the establishment of severe infestations before the bed bugs are eventually detected.

When people do react to the bites, symptoms can include intense itching, swelling, development of pustules, and scarring

As mentioned bed bugs can also have an emotional impact on people who have been affected. Some of the more common problems that are experienced include loss of sleep, experiencing nightmares and suffering from stress and anxiety.

How bed bugs disperse

- Transported from infested areas on personal belongings
- Crawl from feeding sites to other areas in apartment
- Crawl to neighboring units through walls, utility pipes and hallways.





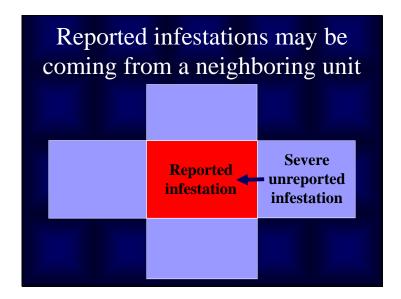


Dispersal of bed bugs occurs by both passive and active means.

Passive dispersal occurs when bbs are carried from one location to another on our personal belongings for example, they can be taken from infested homes into schools or places of work on back packs computer bags and sometimes clothing. Likewise they can be transported from one apartment to another during social visits.

In addition to passive dispersal, bed bugs can also actively disperse between units in multi-occupancy dwellings by crawling from one unit to the next through shared walls, ceilings, and even down hallways.

The higher numbers of bbs an apt has, the greater likelihood that bbs will spread into neighboring units.



In some cases the infestation that is reported is actually originating from an infestation in a neighboring unit that is not being reported for one reason or another and the severity of some of the infestations that aren't being reported can be mind boggling.



Like this infestation which is absolutely disgusting. And you have to wonder how can people continue to live in these conditions without reporting the problem to management?



Or this unit where the box spring was caked almost an inch deep in bed bugs.



And the pillows are covered in blood spatter from the tenant squashing blood filled bugs as they were feeding on their faces while they lay in bed.

How does this happen?

Occupants unwilling or not capable of reporting the problem:

- 1. Trying to avoid attention
 - unauthorized occupants
 - illegal activities taking place in unit
- 2. Mentally handicapped
- 3. Ashamed or embarrassed

So how does this happen?

Often it involves a tenant that won't report the problem because they are engaging in activities that they shouldn't be, and they don't want to draw to attention to themselves.

Other times it is because the occupants have some type of mental handicap that is preventing them from recognizing and reporting the problem.

While other times people are embarrassed or ashamed to tell anyone that they have a problem, until it gets so bad they can't take it anymore.

Whatever the reasons, As you can Imagine, severe infestations that go unreported are extremely difficult to eliminate, can have dramatic financial implications and can seriously impact other units.



So as you can imagine **early detection** is the key to controlling and preventing the spread of bed bugs. A small infestation is much more easily eradicated than a well established infestation so early detection is critical. There are 4 methods commonly used in finding bb infestations. They are

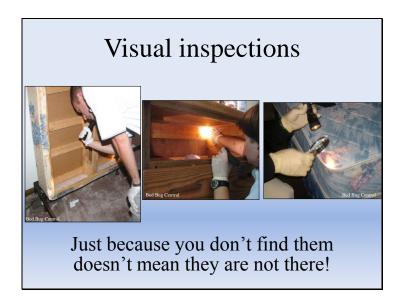
Interviews

- Advantages
 - Provides information on the infestation and treatment history
 - An opportunity for educating residents
- Disadvantages
 - -Unreliable
 - Some residents do not report infestations or do not recognize the presence of bed bugs

A verbal interview with residents can provide some very useful information about the history of the infestation. Such as when and how they first became aware of the problem or how they think it may have been introduced.

It is also a great time to educate residents about the things that they can do to help eradicate the problem as well as things they should not do.

Unfortunately verbal interviews are often unreliable. Some residents may not know they have an infestation while others may not answer honestly because they are embarrassed, ashamed or fear some type of negative repercussion.



Visual inspection is the most commonly used method, but it is very labor intensive and requires an experienced person. A thorough inspection can take anywhere from 30 minutes to an hour or more.

To inspect for bed bugs, you need a good flashlight and a magnifying glass. Tweezers and collecting glass jars will also be useful to collect the live bed bugs found during inspection.

And because bed bugs are so cryptic, it is very important to realize that just because you don't see them doesn't mean they are not there, especially when just a few bugs are present as is typically at the beginning of a new infestation or as eradication is approached.



Where should we be looking for bed bugs during a visual inspection?

Because bed bugs primarily feed upon people when they are sleeping, they are most commonly found in areas where people spend extended periods of time sleeping or resting such as beds and upholstered furniture.



Most people thing you will see the bugs along the edges, seems and tufts of mattresses and box springs?

The fact is however, that often we don't find any bed bug activity in these areas until after the bed bugs have been present for several months or more.

As a result when signs of bed bugs are noticed, bed bugs are well established.

Bed Bugs Inhabit Areas of Least Disruption First

Instead, what really happens is that bed bugs inhabit areas of least disruption first.



For example, during the early stages of an infestation you are not likely to see bed bugs along the mattress seems.



Instead, it may be necessary to remove the dust cover from beneath the box spring in order to find the area where the bed bugs exist.

With such cryptic behavior you can see why it can be so difficult to find low level infestations



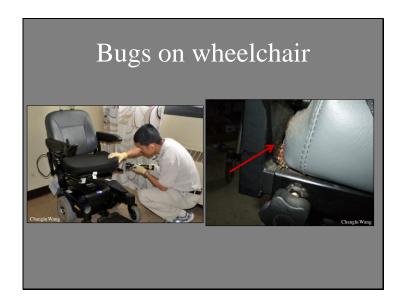
This video shows bbs on a pillow. When you can find bed bugs this easily you know that the infestation has been here for quite some time and is probably quite severe. As I mentioned before infestations like this are often not reported by the resident and if you don't have a pro-active program that is designed to find the infestations that go unreported, the bed bugs will continue to win the war at your complex as they continue to spread and your costs continue to increase.



But bed bugs are not limited to beds and upholstered furniture. They will infest many items and the closer the items are to the sleeping or resting area the more likely they are to become infested. Like these shoes that were stored close to a bed.



Or this badly infested nightstand next to the bed. You can see the live bugs, shed skins, eggs, and fecal material.



Motorized chairs and wheel chairs commonly become infested and this makes a lot of sense because elderly or disable people often stay on wheelchairs or motorized chairs for extended period of time each day. So you want to be sure that they are always inspected.

As you are doing your inspections you really need to understand the behaviors of the occupants to help guide your inspection as well as your control effort. Where do they spend most of their time during the day and evening? Are there certain pieces of furniture that they sit in more than others?



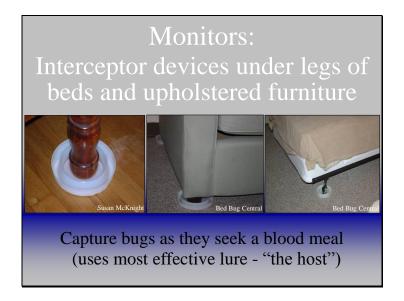
For example, this is the bathroom of a handicapped woman who lived in a badly infested apartment that had been treated repeatedly but there were still bed bugs. It turns out that due to her poor physical condition she spent a great deal of time sitting on the toilet in the bathroom which turned the bathroom into a resting area and hence a perfect area for bed bugs to become established. It wasn't until we discovered this that we were able to solve the problem.



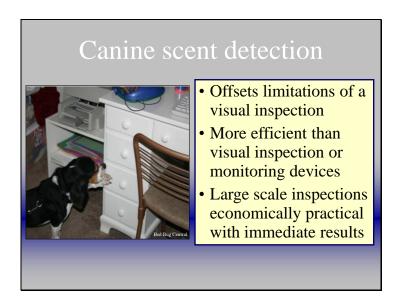
You can see all of the evidence from bed bugs on the hinges and as sad as it is, as the woman sat for extended periods of time on the toilet the bugs would come out to feed.



And as infestations become more well established the number of places they can be found becomes less and less predictable. For example bed bugs were found inside the bindings of these two books, on lace skirt of this stuffed animal and inside the head of an adjustable wrench..



Monitoring devices are another very economical and effective way to detect the presence of bed bugs. Interception devices can be placed under the legs of beds and upholstered furniture and will intercept bugs as they travel to these areas in search of a blood meal.



Canine scent detection is another method that is becoming increasingly more common.

Canine scent offset the limitation of a visual inspection because it does not rely on what can be seen but rather what the dog can smell.

In addition, these types of inspections are typically much more efficient and less invasive than a visual inspection.....



Like most things, canine scent detection also has it's limitations too and is not 100% effective

It's important to realize that bugs and eggs will not be detected if scent is not available to the dogs nose

And false alerts can also be a problem (a False Alert is when a dog alerts that bed bugs are present when in fact they are not)

Verification of Alerts

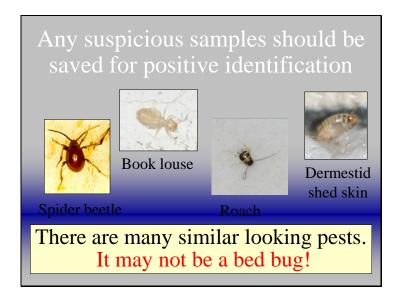
- 1. Visual inspection to confirm activity
- 2. Continued monitoring in areas of concern

Red Bug Centr

If you are using canine scent services should include a verification system for units where the dog indicates that bed bugs are present.

Conduct a visual inspection to try and verify the presence of bed bugs in units where the dog has alerted.

If you cannot confirm an active infestation through visual inspection you should consider installing monitoring devices and keeping a close eye on the unit.



Regardless of which method or combination of methods you are using for detection, you want to be certain that you do not accidentally misidentify the insects that you are looking at.

There are a number of other insects that are commonly found in apartments that can be easily confused with bed bugs if you aren't paying close enough attention or lack the proper training to distinguish them from one another.

Samples that are not clearly bed bugs can be collected and examined by a qualified individual to confirm if it is or isn't a bed bug.



Ok so how do we control bed bugs?

Summary of treatment options Vacuuming • Heat ✓ Clothes dryer Isolation ✓ Encasements ✓ Steam ✓ Contain infested items✓ Make the bed an island ✓ Container ✓ Whole unit Pesticides Freezing ✓ Liquid CO2 ✓ Spray ✓ Chest freezer ✓ Dust

There are many options available for treating an bb infestation as you can see from this list.

Many of these methods can be done safely and easily by residents and housing staff. Others are best left to a professional.

An effective and sustainable bed bug management program involves a combination of multiple methods and cooperation among residents, staff, and the pest control provider.

Bed bug prevention

- Avoid picking up discarded or second-hand items (especially beds & furniture)
- Avoid sitting on furniture when in infested apartments & limit what you bring in with you
- If itchy welts occur, immediately conduct a thorough inspection





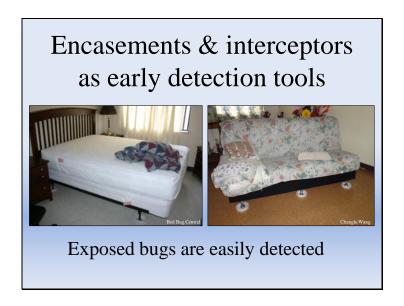
The first step is to have a bb prevention plan. While there is no real way to prevent bed bugs we can take steps to minimize new introductions.

For example,

Avoid picking up discarded or second-hand items (especially beds & furniture). The same is true for shopping in second hand stores like Thrift Shops. The reality is that we will never stop people from picking up or purchasing used items but they should be educated that this is risky behavior and if they are going to bring in used items they should at least be thoroughly inspected first.

If you are working in or visiting an invested apartment avoid sitting on furniture when in infested apartments & limit what you bring in with you.

And if itchy welts occur that you can't explain this doesn't mean that you have bed bugs but certainly warrants a thorough inspection and monitoring to try and confirm if bed bugs are present.



Utilize early detection tools.

Encasements and interceptor devices are very effective tools when it comes to early detection.

These tools prevent bed bugs from getting into areas within the mattress, box spring or furniture where they can remain well hidden. With the bed bugs now exposed they can be readily detected.



In the event that an infestation does exist one of the most important questions becomes what do with infested beds.

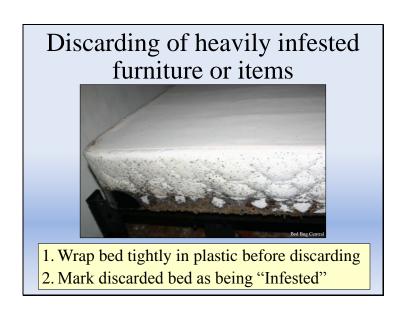


The knee jerk reaction that typically occurs is to either discard the bed or treat it with insecticides, but neither is necessary.



We just discussed encasements as a pro-active early detection tool, but they also play a very big role as a control tool.

Beds that are infested with bed bugs can be salvaged by....

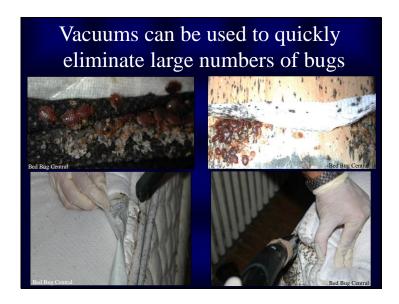


In some cases a bed or other item may be so severely infested that the resident no longer wants to keep it. If infested items are going to be discarded it is important that it is done in the proper manner.

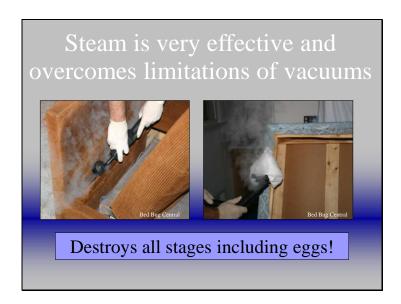
The last thing you want to do is transport an infested item out of an apartment and through the building if it has not been properly prepared for disposal this is a great way to spread bed bugs everywhere and creates a risk for people who may pick up the discarded item and bring it into their own home.

So prior to discarding any infested item you should first:

- Wrap bed tightly in plastic before discarding
- Mark discarded bed as being "Infested"



Vacuums can be used to very efficiently remove large numbers of bed bugs however, they often fail to dislodge many of the eggs and will not get bugs that are deep inside of cracks and crevices. You also must be careful not to spread infestations via the vacuum. First you want to have a dedicated vacuum that is not used for any other purpose than bed bugs. Immediately after each use, the vacuum bags must be removed, sealed tightly in a plastic bag and discarded. The vacuum should be inspected for bed bugs and then sealed in a plastic bag until it is used the next time.



Steam is a very effective option that overcomes the limitations of a vacuum and will destroy all stages of the bugs including the eggs.

It is also one of the best options for physically destroying bed bugs on upholstered furniture because the steam can penetrate the fabric, penetrating through pleats and folds with lethal temperatures.

This is a safe and economical method and can be done by a building staff.



Pay attention that it should be done slowly to allow steam penetrate thick materials such as folds and seams of a sofa. Hot steam may need to be re-applied a few times to eradicate an infestation and often is used on conjunction with other methods.



Hot Laundering is another very effective method for destroying bed bugs.

The frequent laundering of items that can't be treated with pesticides like bed linens, clothing, or stuffed animals will greatly assist in eliminating bugs and eggs that may be associated with these items.



Items that can't be laundered may be placed in a portable heating chamber following the manufacturer's instructions.



But heat is not the only way to kill bed bugs, bagging and placing infested items in a household freezer for four days is another option.



De-cluttering will reduce bb harborages and make the treatment much easier. Place clutters stored in plastic bins or heavy duty plastic bags.

Discourage application of consumer spray products by residents

- Many bed bug populations are resistant to insecticides.
- Application of sprays may cause bed bugs to disperse making them harder to eliminate.
- Foggers/bug bombs can be dangerous are not effective!





Resident should be strongly discouraged from using over the counter consumer insecticide products.

In general these products typically don't work well and because residents are not trained in the proper application of these products and often fail to carefully follow the label directions for proper use.

As a result applications tend to be ineffective and can be dangerous, particularly in the case of bug bombs.

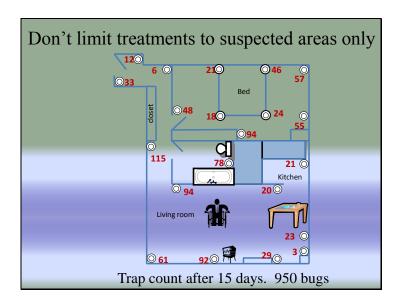


This is an example of how products are misused.

Dusts like DE (Diatomaceous Earth) can be very effective but should be applied as a thin layer of insecticide dust such as diatomaceous earth dust to cracks, crevices and around perimeter of the sleeping areas



To avoid problems the application of pesticides should be limited to experienced pest control professionals or staff members who maintain a pesticide applicators license with the State.



It's also important that treatments are not limited only to areas where you have seen or suspect bed bug activity.

Bed bugs are much more mobile that most people realize and may travel throughout the entire dwelling.

This is a unit where we placed bed bug monitors throughout the entire apartment and as you can see bed bugs were found in all of the monitors. The largest number of bed bugs was found in the hallway across the bathroom, not in the BR or the LR. Large numbers of bed bugs also appeared in the entry door area. Therefore, bed bug activity in an apartment is definitely not limited to the sleeping or resting areas, and bed bugs can easily migrate out of the apartment through the entry door.

All rooms may have bed bug activities treatments should not be limited to only areas believed to be infested.



Regardless of how thorough your effort is it is unlikely that a well established population will be eliminated in a single visit for all of the reasons that we have already discussed.

So it is critical that a follow up visits continue every two weeks until the infestation has been eliminated.



It can be very difficult to determine when an infestation has been completely eradicated.

Use a combination of interviews, inspection and monitoring to achieve 6 consecutive weeks with no new bugs or bites. After six bug and bite free weeks there is a reasonably good chance that the problem has been eliminated.

Community-wide results requires a proactive plan!

An effective plan will:

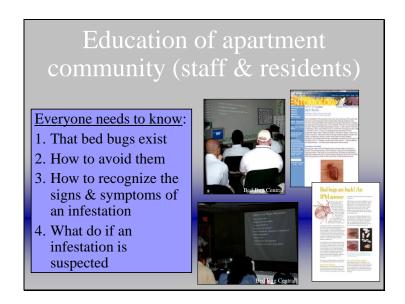
1. Provide cost effective elimination

2. Manage spread

3. Achieve long-term results

Often it seems like we are fighting a losing battle and costs continue to escalate. For effective community wide results you need a pro-active plan that:

- Provides cost effective elimination of bed bugs
- Manages the spread of bed bugs between units
- Achieves long-term results



It starts with community wide education for staff and residents alike.

Everyone must be familiar with what bed bugs are, how to recognize the signs and symptoms of an infestation and what to do if an infestation is suspected. You can use this presentation as well as the other educational materials that we are providing you with to carry out your education program.

Conduct a baseline community wide inspection program

360-unit apartment building

- 19 infestations reported by residents
- 43 additional infestations identified through building wide inspection & installation of interceptors (7-d)
 - -85% (43/62) of the infestations were not reported by residents!

Conduct annual building-wide inspections if >10% infestation rate

It is also a very good idea to conduct a baseline community wide inspection to find out exactly how many infestations you are actually dealing with.

I would like to use this case study of a 360 apartment building to illustrate the importance of community wide efforts.

There were 360 units in the complex. The management was aware of 19 infestations before we began our inspection effort and we discovered an additional 43 infestations during our inspections.

Inspections consisted of very basic inspections of the visible areas of the mattress and box spring, just enough to find obvious infestations that had not been reported by residents and then interceptor devices placed under the legs of beds for a one week and then inspected.

A total 43 additional infestations were identified through visual inspection and placement of interceptors.

But what is most important to realize here is that 85% percent of the 62 infestations were not reported by the occupants of the infested units. So you can see the trouble if you are going to rely solely on your residents to report infestations to you.

History has a tendency to repeat itself, use it to your advantage

Conduct periodic inspections of "at risk units"

- ❖ Any unit with activity within past year
- * Residents that failed to report infestations
- Residents that were uncooperative are prone to population rebound and/or re-infestation

If you turn your back on unit with bed bug history you will get burned!

It is also important to recognize the history has a tendency of repeating itself and thus units that had a problem in the past are going to be high risk units again in the future. So it is important that we have a proactive inspection program in place for this segment of your resident community.

Not only is it advisable to inspect these units periodically, say at least twice per year, but it would also be a good idea to inspect the surrounding units as well.

Catch bed bugs at the gate: implement a new resident program:

- 1. Build education into resident orientation:
 - educational videos, presentation & fact sheets
 - bed bug management policy and procedure
- 2. Visual inspection of beds and upholstered furniture at time of move in
- 3. Monitor and inspect apartment within 30 days of move in (monitor for 2 weeks)

So now we are keeping an eye on some core units that are considered high risk. The next step is to minimize the introduction of new infestations.

Part of this is your community education program another part is a "New Resident" program.

Provide new residents education during their resident orientation:

- Educational video, presentation & fact sheets
- bed bug management policy and procedure

You may also want to conduct visual inspection of beds and upholstered furniture at time of move in.

And then monitor and inspect apartment within 30 days of move in (monitor for 2 weeks).

Procedure for vacating units

Implement policy to inspect and monitor units when a tenant notifies the leasing office that they will not be renewing their lease.

Identifying infestations prior to unit vacating gives you time to eliminate the infestation while a host (tenant) is still present!

And just as we are inspecting units as they are occupied, we should also look a them before they are vacated so we don't end up with an active infestation in a vacant unit. Anyone that has dealt with a vacant unit that is infested knows that this is among the worst things that can happen. SO THIS IS SOMETHING THAT YOU ABSOLUTELY NEED TO AVOID.

And you can do this by inspecting and monitoring units as soon as you learn that a tenant is not going to be renewing their lease. This way if you identify that they have a problem that they were unaware of or that they have not reported, you still have time to eliminate it before they vacate the unit leaving you with a problem that there are still no good answers for.

When infestations are identified...

Respond quickly and be sure to:

- Remind residents what they can do to help
- Get involved if a resident is not cooperating or obstructing eradication efforts
- Include surrounding units in scope of service
 - visual inspection and monitoring
 - continue inspecting until primary infestation eliminated
 - encase mattresses & box springs if budget permits
- Make sure the treatment program is designed to see problem through to "elimination"

And finally, whenever an infestation is reported or identified you want to Respond Quickly and Aggressively.

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Remember successful control is a team effort.

I use this graphic of a three legged stool because bed bug management requires equal support from the property management, pest control vendor and the resident. If any leg is not supported equally the stool will be off balance and will tumble over.

Residents must know their role, property management must be behind the program and willing to support it and step in when residents do not cooperate and the pest control provider must be capable of achieving results.

Additional information

- Web site
 - http://www.epa.gov/bedbugs/
- E-mail questions and suggestions to cwang@aesop.rutgers.edu

Funding of this program is provided by U.S. EPA

For more information, please visit the following web site. Questions and suggestions may be sent to ...

I would also like to acknowledge the US EPA for financial support of this program.

I would like to thank you for your time and attention and open the floor for questions.