

How to Talk to Callers About Bed Bugs ***(Cimex lectularius)***

**chintzes or chinchies
mahogany flats
red coats
crimson ramblers
wall lice
the bug that nobody knows
lentils on legs
animated blood drops**

Allison Taisey
Carolyn Klass
Jody Gangloff-Kaufmann

This packet provides you with the basics of integrated bed bug management—inspection, identification, control, and prevention.

Callers may be convinced they have bed bugs before they seek your advice. If not, they're being wonderfully proactive and should be applauded. Callers who've already found bed bugs *must have a sample for identification*. They should capture the bed bug in a baggie, put it in the freezer, and contact a professional (contact info on page 7).

Callers should always be advised to call a professional pest control company when they know they have bed bugs. Targeting this pest takes expertise. Over-the-counter insecticides rarely eliminate bed bugs—they sometimes cause them to spread into other rooms. Because labels vary state-to-state you can't endorse any product.

Make a few calls to pest control companies as if you had bed bugs. It'll help you know what your callers are dealing with.

The general course of your conversation should be:

- 1. Establish what the situation is.**
- 2. Find out how much the caller knows.**
- 3. Educate and advise to meet the caller's needs.**

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Resources

The resources listed here may contain state-specific information that will not apply to your state. Check with your local agencies for state-specific laws and regulations that may apply.

Printable:

University of Kentucky Cooperative Extension Service

www.ca.uky.edu/entomology/entfacts/entfactpdf/ef636.pdf

Ohio State University Extension

ohioline.osu.edu/hyg-fact/2000/pdf/2105.pdf

University of Minnesota Extension

www.extension.umn.edu/distribution/housingandclothing/components/DK1022.pdf

www.ipmctoc.umn.edu/Control_of_bedbugs_in_residences_US_Commercial.pdf

Purdue University Medical Entomology

www.entm.purdue.edu/publichealth/insects/bedbug.html

New York State Integrated Pest Management Program

www.nysipm.cornell.edu/publications/bed_bugs/files/bed_bug.pdf

Websites:

bedbugger.com

bedbugcentral.com/bed_bugs_101.asp?p=all

en.wikipedia.org/wiki/Bedbug

npic.orst.edu/pest.htm

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Resources

Book:

Here's the review:

“The *Bed Bug Handbook* is a complete and up-to-date guide to bed bugs and their control. Extensively illustrated and with 286 pages, the handbook provides practical step-by-step guidance for preventing bed bug infestations and for controlling bed bug outbreaks. It includes details on bed bug inspections and methods of control including mechanical (encasements, vacuuming), thermal (dry heat, steam, and cold), insecticide treatments, and fumigation.

The *Bed Bug Handbook* also includes chapters on bed bug biology and habits, how bed bugs spread, business and management considerations, and medical and social impacts. There are also checklists for preventing and controlling bed bugs in apartments, hotels, furniture rental warehouses, and other sites.

Written primarily for professional pest control specialists and the managers of hotels, apartments, and other commercial operations susceptible to bed bug infestations the *Bed Bug Handbook* is a valuable resource for anyone interested in bed bugs and their control. The authors are entomologists with extensive experience dealing with bed bugs. Rick Cooper is the Technical Director of Cooper Pest Solutions of New Jersey, and one of the pest control industry's leading experts on bed bugs. Larry Pinto and Sandy Kraft are pest control consultants and publishers. They have written dozens of pest control books and hundreds of articles, and have published *Techletter* for pest control technicians since 1985.

Publisher: Pinto & Associates, Inc. (publishers of *Techletter*)”

You can order it here: <https://secure.netsolhost.com/techletter.com/bedbugalert.html>

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Overview

Talking Points for Every Call	6
Bed Bug Basics	7
What They Are	
Where They Came From	
Growth & Feeding	
Why Are People Afraid?	10
News That Your Caller May Have Seen	
Founded Fears	
Unfounded Fears	
Inspection.....	13
Where Are Bed Bugs Found?	
Inspection Tools	
How To Inspect	
Confirming Identification	
Control.....	16
What Does An IPM Plan Look Like?	
Giving Pest Control Companies A Chance	
Infestation History	
What A Pest Control Company Should Do	
Customer Preparation	
Cost	
Treatment & Follow-Up	
Nonchemical D.I.Y. Treatment Options	
Treatments That Don't Work	
Types Of Callers And Their Worries.....	25
Homeowners	
Landlords	
Tenants Or Dorm Residents	
Travelers	
Contacts.....	28
References.....	29

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

In your conversation you should find a way to ...

Tell callers that knowing the enemy is key to getting rid of them, so you're going to talk about their life cycle. Dealing with bed bugs requires thorough preparation. If callers understand why it is important, they're more likely to do the out-and-out preparation required to get rid of bed bugs. Avoid using the word "clutter" since even the cleanest room will require extensive preparation and the caller may already feel insecure. At least describe what you mean by clutter. You don't want to propagate the belief that bed bugs are associated with filth. Instead, talk about stuff, things, items, piles, knick-knacks, etc. or discuss specific items and areas.

Caution callers against using over-the-counter insecticides. **Why?** If they try to get rid of the bed bugs on their own and it doesn't work, *then* they call a pest control company:

- Even more chemicals get used.
- The bed bugs will have moved to new hiding spots making it harder for pest management professionals—PMPs—to target them.

Despite your warning, many people will try at-home remedies. Tell callers to **READ THE LABEL** of any product they use. They should know to read labels carefully. If the product is labeled for indoor use, do not use. If the product isn't labeled specifically for use on a mattress, it shouldn't be used on a mattress. They should keep records of everything they do (date, location, and chemical or tool used).

Instruct the caller on how to inspect for bed bugs. If we're to curb the spread of this pest, everyone needs to know how to inspect—at home, shopping for furniture, or when they're traveling. It's the only way we can prevent spreading them around.

There is no need to throw away belongings with bed bugs. Anything they think might have bed bugs should be treated by a PMP. If they want to get rid of things, take caution.

Warn caller...

- used furniture may have bed bugs.
- infested things on the curb may be brought home by others—ruin by cutting fabric or spray-painting a picture of a bug (helps warn passersby who don't speak English) and writing "bed bugs."
- Moving infested items may knock off bed bugs—seal in a bag or cover (shipping stores sell large plastic encasements) before moving.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Bed Bug Basics: *What They Are*

Bed bugs live off blood—like mosquitoes. They probably prefer to feed on people, but if people move out, they can survive on rats or mice—so control these pests, too. PMPs have seen bed bugs feeding on pets, but no one knows if they prefer pets.

Bed bugs have close relatives: poultry (*Haematosiphon inodorus*), swallow bugs (*Oeciacus vicarius*), bat bugs (*Cimex pilosellus*), and tropical bed bugs (*Cimex Hemipterus*)—to name a few. They too can feed on humans and act like bed bugs do. For accurate identification, send a sample—preferably several adults—to:

- a cooperative extension diagnostic lab:
www.csrees.usda.gov/Extension/index.html
- board-certified entomologist:
www.entsoc.org/certification/public/roster/Rosters_bce.aspx

If the critter is, for example, a bat bug, a professional should be brought in to find and remove bats, then prevent their re-entry.

Bed bugs are visible to the naked eye ... the trick is finding their hiding spots. Although the adults can be 1/4 inch long, they're flat. They can wedge themselves into any crack or crevice. If the edge of a credit card can fit, so can a bed bug.

Bed bugs aren't social insects like ants, so they don't need a colony. But they do group together in good hiding spots. Still, loners are likely to hide elsewhere. This is another reason an experienced PMP is important. Good PMPs know how to find them and how to target every hiding place without harming people.

More on bed bug biology (and yes, it matters): they have an odd way of making babies. It's called traumatic insemination. Males simply stab females in the side with their reproductive organ and inject their sperm, which makes its way to her eggs. Females recover from one mating, but several matings increase the chance of infection and death. Females may try to get away from groups of males and go off and hide alone to avoid being stabbed to death. *If your callers don't find her, she'll keep laying eggs and could restart an infestation: another reason to get a PMP involved.*

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Bed Bug Basics: *Where They Came From and Why They're Back*

Bed bugs may have evolved when a close relative, the bat bug, switched to feeding off cave-dwelling humans. The ancient Egyptians, Greeks, and Romans wrote about them. They were part of many peoples' lives in the U.S. and around the world before World War II.

Then DDT came along. DDT seemed wonderful at the time. Unlike most of the pesticides sold in stores today, DDT had a lasting effect—a long residual effect. Insects died when they crawled where DDT was used, even if it had been there for weeks. Though most homeowners used DDT for large pests like cockroaches, it did the bed bugs in too. When the bed bugs came out to feed, there was something there to kill them.

Modern furnishings and appliances helped too. Bed bugs don't care if a home is clean or messy. They just like good hiding spots. When modern furniture came into style they had fewer hiding spots. Home appliances such as washing machines and vacuums helped keep them at bay. Bed bugs were a rarity in the US from the early 1950's through the late 1990's. A whole generation of people grew up who'd never seen one.

By the mid 1970's chemicals like DDT, which were blamed for environmental problems, were on the outs. The pest control industry began to use the environmentally friendly approaches common today. Using nonchemical traps and monitors, blocking entry into homes, and using pest-specific, least-toxic chemicals became the staples of an integrated approach. Bed bugs are not susceptible to most of the treatments used for other pests. This, online sales of used furniture and increased travel from areas that never got rid of bed bugs is thought to have brought them back.

Unfortunately, bed bugs had been off the radar for so long they were almost forgotten. By the time anyone noticed, they were back in a big way. Right now there are no traps or monitors proven to detect a population when it's still small. And since bed bugs travel on things such as luggage, souvenirs, and furniture we bring into our homes, it's hard to block their entry.

Fortunately, some modern pesticides work well. Because these chemicals break down quickly—making them safer for humans—they may not be around to kill the bed bugs that hatch from eggs laid before the chemical was applied. Two or more carefully targeted applications are often the only way to safely eliminate bed bugs. It would take an extremely capable and dedicated person to learn and do everything necessary to get rid of bed bugs on their own.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Bed Bug Basics: *Growth & Feeding*

- Life Stages: Eggs hatch into “nymphs” which become adults in 5 weeks, after going through 5 molts (when they shed their old, smaller skin). They must feed before each molt.
- Nymphs look like small adults.
- Females can produce 5-7 eggs per week, laying up to 500 in a lifetime.
- Grow fastest and lay most eggs at about 80°F.
- Feed only on blood.
- Feed when host is sleeping or sitting quietly, often when it’s dark.
- Seek shelter in cracks and crevices when not feeding.
- Bed bugs poop “blood spots.” Spots look like dots made by a fine felt-tipped marker and will be found near where they fed and near their hideouts.
- Adults can live over a year without a meal.
- Can survive sustained heat and cold if given time to adjust.
- Not a filth pest.
- No “grooming behavior”—meaning that insecticides meant to be swallowed by roaches and flies won’t work on bed bugs.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Why Are People Afraid? *News Callers May Have Seen Or Heard*

Stories are being told every day...

On the web

- “Bed Bugs Bite Back”
www.msnbc.msn.com/id/11916682/
- “Bed Bugs! Attack!”
www.youtube.com/watch?v=4qx751dNw7Q

On the radio

- “Pesky and Not Picky, Bed Bugs Make a Comeback”
www.npr.org/templates/story/story.php?storyId=13829937

In the paper

- “New Tactics Take a Bite Out of Bed Bugs”
online.wsj.com/article/SB120596873874750153.html

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Why Are People Afraid? *Founded Fears*

Legal Repercussions

Many people have been in lawsuits over bed bugs since they came back into the limelight in the late 1990's. It's usually hard to identify who's technically at fault because bed bugs can enter a space in any number of ways. The laws differ by state and are constantly being revised as the problem grows.

Tell them: bed bug problems won't just work themselves out. Left untreated, they will spread. The best way a caller can cover all bases is to inform all who are potentially involved *early on*—managers, neighbors, friends...

Take steps to solve the problem:

- Call the local health department to find out what regulations apply.
- Call a professional pest control company.
- Document everything.

Delusions of Parasitosis

The thought of bed bugs gives many people the heebie jeebies. Most extreme is delusory parasitosis. Callers with delusory parasitosis can't shake the idea that parasites are plaguing them. Sometimes they'll send samples of lint or scabs for identification—but no insects. Bed bugs never burrow into the skin. They don't have the body parts to do so. If people call several times and can't be convinced that they don't have parasites, consider this condition, but you are not qualified to diagnose them. Don't agree to appease them. Tell them how to inspect their home and suggest they see a doctor. Never give medical advice.

For more information, see the Spring 2000 *American Entomologist* article at <http://www.ent.uga.edu/pubs/delusory.pdf>

Tarnishing a Reputation

Bed bugs can be a public relations nightmare. You'd hope customers would respect a proactive hotel, motel, or landlord who tried to educate them *before* a problem came in, but that's rarely the case. Simply the mention of bed bugs can deter customers. And householders worry what friends, family, and neighbors will say if their problem becomes known. Bed bugs aren't associated with filth or social status, but many people think they are.

Infestations get out of hand by trying to keep them secret. Do-it-yourself products can drive bed bugs into neighboring rooms, making the problem harder (and costlier) to tackle when a PMP gets involved. Not warning other people robs them of the chance to avoid bringing bed bugs into their homes and businesses. Remember—treat, then destroy before putting them on the curb. Live insects or eggs may drop off while moving things from one place to another—best to get rid of the bed bugs and then decide what to trash.

The Bite Itself

You can't describe the bites as looking only one way. Some people don't react at all. On the opposite extreme, others get itchy welts that take two weeks to heal. Bites can occur singly, in clumps, or in a line. Bites can show up within hours—or two weeks later. Confirming an infestation on bites alone is impossible. You need evidence: cast skins and blood spots or the bugs themselves.

Why Are People Afraid? *Unfounded Fears*

Fear: Bed bugs can transmit disease

Bed bugs aren't known to pass on disease. Although they can carry at least 24 pathogens, none (including HIV and Hepatitis) have been transmitted in the laboratory or (to the best of our knowledge) the field.

Fear: Bed bugs will infest pets the way fleas do

Bed bugs *can* feed on pets. A pet could carry a bed bug from one room to another. The bugs might get caught in a pet's hair, but they won't live on pets the way fleas do. Bed bugs rarely feed for more than 10 minutes and their feet don't grip onto hair. Twenty minutes of grooming outside lets you rest at ease.

Fear: Spraying pesticides will poison the home

Fighting this fear could be your greatest challenge in getting a caller to use a PMP. A good PMP should use more than just insecticides in a bed bug treatment. See the Control pages: 16-21.

Gone are the days of the "exterminator." Most formulations used in pest control today have little residual effect. It's not great for pest control, but is done with the well being of the family and the environment in mind. A licensed PMP should use only labeled formulations at proper dilutions and should *FOLLOW THE LABEL*.

Callers and PMPs will work *together* to fight bed bugs, so they need to be honest with each other. Encourage callers to educate themselves and shop around, but definitely involve a professional.

Clients have the right to know what's being applied in their home and at what concentration. EPA Reg. numbers are on the label. Material Safety Data Sheets (MSDS) are available online for the active ingredient for all products (and often from the pest control company). If callers are worried about children, the elderly, pregnancy, ill people, or pets, a doctor or veterinarian can use the EPA Reg. # and MSDS to tell them what precautions to take. The National Pesticide Information Center (NPIC) can also be accessed by phone ((800) 858-7378) or internet (npic.orst.edu). A pest control company should also have standard operating procedures for sensitive cases.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Inspection: *Where Are Bed Bugs Found?*

Places with a high turnover of people spending the night—hostels, hotels near airports, and resorts—are most at risk.

If callers have or suspect bed bugs at home, one of several scenarios may have caused the problem. Try to figure out which applies, because the source of the infestation determines where inspection should start.

Don't let callers get too hung up on figuring out where they came from. More important is helping them understand how their problem could spread to neighbors, schools, public transportation, and visitors if they're not careful.

Callers need to confirm whether they have bed bugs—and they should start with the most suspect areas first. If they find a live bed bug, tell them to: freeze it for identification or put it in a sealed jar with a 1 tsp of rubbing alcohol, stop looking (to avoid disrupting the bugs), and call a professional.

Discuss these scenarios:

- Only one bedroom: inspect that room first.
- People often rest on a couch: inspect it after inspecting the bedroom.
- A traveler returned home: insects can hide in luggage and then crawl out when it's dark and peaceful, inspection should begin where the luggage was placed upon returning home.
- A used bed or piece of furniture (bought or from the curb) was brought into the house: inspect it first.
- The problem began after a visitor stayed overnight: inspect where their luggage was placed and the beds that they slept in. Next, inspect the nearest place people frequently sleep.
- An infestation persists after several treatments by a professional: bed bugs may come through the wall from a neighboring apartment so inspect the rooms that share a wall with a neighbor. This scenario happens in large apartment complexes and hotels where management didn't get adjacent rooms treated.
- If they live in an apartment building, *laundry rooms should be inspected too.*

Bed bugs can be—anywhere!

Airports	Health Clubs	Office Building
Apartments	Homes	Resorts
Barracks	Hospitals	Restaurants
Buses	Hostels	Schools
Cabins	Hotels and Motels	Subways
Churches	Jets	Theaters
Community Centers	Laundromats	Trains
Cruise Ships	Motor Homes	Used Furniture Outlets
Dormitories	Moving Vans	
Dressing Rooms	Nursing Homes	Wherever there are people...

Inspection: *Inspection Tools*

Use these tools during the inspection:

- flashlight
- magnifier or hand lens
- a vial, pill bottle, or ziplock bag to hold specimens for identification
- tweezers to help grab
- gloves (vinyl, latex, etc.—or even a plastic bag over your hand)
- knife, index card, or credit card for swiping bed bugs out of cracks
- trash bags and tape for bagging infested items
- vacuum cleaner—if used, it'll have live bed bugs in it. Immediately dispose of properly.

Inspection: *How To Inspect*

Callers should look for eggs, nymphs, adults, cast skins, or blood spots. Note: blood spots, hatched eggs, and cast skin may be from an infestation that's been dealt with already. But since the tolerance level for bed bugs is usually zero, this may be enough for people to treat. Use a flashlight—even if it's well lit—and a magnifying glass and work systematically. Start with one corner of the mattress and work around the piping, down the sides, and underneath. Do the same with the box spring. *Slowly* remove the dust cover (“ticking”) on the bottom and seal in a trash bag. Then inspect the bed frame. If it can be taken apart, do so.

If no bed bugs show up, work out from the bed in a systematic (clockwise or counter-clockwise) direction out to the walls of the room. *Nothing should be left uninspected. Any crack, crevice, or joint that a credit card edge could fit in could hide bed bugs.* This routine gives callers a systematic approach, increases the chances that evidence will be found at the beginning of the search, and helps them understand how hard bed bug jobs can be without their cooperation in bagging clutter and drawer contents. At night, lifting the sheets and turning on a flashlight might lead to a discovery, but this method of detection can be unsettling.

If people find bed bugs, it's best they keep sleeping in their bed—or try to find *someone* who will sleep there. Packing up to spend the night elsewhere may bring bugs to an uninfested area *and* the bugs may move to neighboring rooms in search of a meal.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Inspection: *Confirming Identification*

Since people's perceptions differ, confirm that callers' pests are bed bugs by

- how they look
- where they were found
- when they were found
- how they behave

What do bed bugs look like?

1/4" long, oval, 6 legs, and reddish-brown.

Anatomy: A bed bug has 6 legs. Its antennae point forward and are about half as long as the body—not longer. Its head is broadly attached to its body and it has no wings. Eight legs indicate a tick. Six legs and long antennae with two spikes coming off the back (cerci) might be a roach nymph. Carpet beetle larvae have hairs all over their bodies. Carpet beetle adults have two hard wings.

Color: A “drop of blood with legs” is probably a recently fed bed bug. It will be red, plump, and oval. After it digests its meal, it'll be mahogany-colored, round, and flat. Unfed nymphs are tan. Eggs are oval, white, and stick to whatever they're laid on.

Size: Eggs and just-hatched nymphs are *tiny*: a twentieth of an inch (1mm) long—if people can even imagine that. They're the size of the “R” in “LIBERTY” on a penny. Adults can be up to 1/4” (6mm) long. Both of these sizes are for flat bed bugs...they'll plump up after feeding—just like a mosquito.

Location: Finding bugs in places where people rest or sleep—bedrooms and living rooms—helps confirm them. Ditto with finding them in their luggage. See page 13.

Behavior: Bed bugs scurry into dark, tight spaces to hide—moves as fast as an ant. If the insect came out on its own accord at night when the lights were out near the bed or a couch, it was probably a bed bug looking for a meal.

If callers say they have bugs they think are bed bugs that come in the spring but go away during the summer—they might be bat bugs. Bats in attics hibernate elsewhere during the winter. Bat bugs that are left behind go dormant, but if warm weather comes before the bats return, they may seek another host to tide them over. In this scenario, inspect the attic, and external wall voids. Have PMP treat these roosts as well as the rooms bed bugs were found in. To prevent bat re-entry, repair *all* holes 1/4” or larger that lead to the outside.



Adult feeding on a man.
Scale bar = 1mm



Adult, 4 nymphs, and 2 blood spots on particle board.
Scale bar =1mm



Eggs on a mattress.
Scale bar =1mm

Control: *What does an IPM plan for bed bugs look like?*

Integrated Pest Management (IPM) is currently the preferred method of pest control because it's cost-effective, works, and lessens reliance on chemicals. Note: IPM doesn't mean no chemicals. Callers with bed bugs should call a professional dedicated to IPM so the least amount of pesticides can be used and still work. An IPM plan allows you to answer:

- How many pests are too many? See Threshold.
- What can I personally do to avoid and kill the pest? See Cultural Control.
- What other living things can help kill the pest? See Biological Control.
- How can a professional help? See Chemical Control.
- How do I know if the plan is working? See Monitoring.

IPM approaches a pest problem from several angles:

Establish Threshold: This is the number of bed bugs the situation can tolerate before using another pest control tactic. Most people establish the threshold at one bug.

Cultural and Mechanical Control: Cultural and mechanical control makes the environment inhospitable, blocks the movement of bed bugs to feeding locations, or at least makes detecting bed bugs easier.

- Choose furniture of plain design. A metal chair offers fewer places for a bed bug to hide than a wicker one.
- Don't buy or pick up used furniture.
- Choose light-colored bedding—easier to see insects and blood spots.
- Don't store things under beds.
- Use tightly fitting, zippered, bed-bug proof mattress and box spring “encasements.” Putting them in place ahead of time (proactively) makes bed bugs easier to see since encasements have no piping or tags and they're light colored. Putting them on during an infestation means no need to throw away the mattress and box spring. *But ...* check periodically to be sure they haven't torn.
- Vacuum regularly
- Maintain a gap between the walls and the bedroom and living room furniture.
- Seal cracks in wooden floors.
- Repair peeling wallpaper.
- Keep bedding and dust ruffles from touching the floor. Better yet, remove the ruffles.
- When returning from a trip, unpack on a light colored, bare wood or vinyl floor keeping an eye out for bed bugs. Put everything that traveled in a dryer for an hour on a hot cycle. Put things that can't be heated in a freezer for two weeks.
- When traveling, inspect rooms, keep luggage closed, and use luggage racks away from the wall—don't leave things on the bed!

More suggestions on page 22.

Biological Control: Spiders, cockroaches and ants eat bed bugs—but that doesn't take care of your problem! No known biological control agents target bed bugs, though bed-bug-specific fungi and bacteria have potential and are being researched.

Chemical Control: Licensed PMPs know what products in what formulations should be used and where. They know how to be selective *and* effective—fewer chemicals used and best results.

Monitoring: This involves inspecting regularly to be sure:

- Control is working.
- Bed bugs haven't been brought back in.
- Encasements haven't torn.

No tools yet exist that verify bed bugs are present, so callers should inspect anywhere that would be prone to bed bugs. Some PMPs include monitoring in their contracts. On the horizon...dogs trained to sniff out bed bugs and maybe even tell new infestations from old. As with PMPs, make sure the trainers and dogs have credentials.

Control: Giving Pest Control Companies A Chance

“Exterminator” is a hard term to get out of the public’s vocabulary. It has been out of the pest control industry’s for years. Callers aren’t alone in wanting least-toxic ways to control pests. That’s why many in the industry use IPM. *Callers should be encouraged to hire only companies that have licensed PMPs and are affiliated with a state or national association.* This helps ensure that the company stays up-to-date on the current practices.

Make these points:

- PMPs are trained for sensitive situations: people who are ill, children, pregnant women, pets, and more. They know how to keep people safe from insecticides. They also know best how to find bed bugs.
- The EPA must register pesticides and (in most cases) the state before they can be put on the market—PMPs will not use illegal pesticides.
- If callers use chemicals themselves, then have to call in a professional, overall chemical use will be higher than otherwise. Plus, what they used could drive bed bugs into new areas—making removal take longer and be pricier too.
- The *only* advantage of the over-the-counter products is that they’re cheaper than a full bed bug job done by a professional.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Control: *Infestation History*

These questions help callers prepare to call a professional. Send them a copy of these questions to make it easier for everyone. Download additional copies at http://www.nysipm.cornell.edu/publications/bed_bugs/files/infestation_history.pdf, 75k pdf file.

1. Square footage of home, unit, or room.*
2. Square footage of infested area, if known.*
3. How long has the problem persisted?
(Time from travel/ when a friend visited/ when bites where first noticed.)
4. How long will it realistically take to prepare for treatment to be done?
It may be more than the company asks for, but to be safe, estimate when all of these could be finished:
 - *empty drawers*
 - *take apart bed frame*
 - *take pictures off walls and place on the floor*
 - *move furniture at least two feet from the wall*
 - *vacuum thoroughly; place vacuum bag contents in a tightly closed bag and freeze it*
 - *put all shoes, drawer contents, etc. in tightly closed tupperware containers*
 - *wash clothes, curtains, bedding, etc. in hot water and dryer*
 - *buy and put zippered encasements on mattress and box spring*
5. Are there ill people, pets, pregnant women, or children at home?
6. Can the home be empty for four hours after each treatment?
7. Who will be responsible for the contract and payment?
8. Other details about the job:
(willingness of residents of adjacent units involved, allergies, etc ...)

** Ask if they have a tape measure, or even get them to pace it off for a crude measurement. Help with multiplication if they seem unsure.*

See next page.

9. Have any chemicals been applied?

Date	Chemical Name & EPA Reg.#	Where Applied	How Much	Observations

3. Evidence:

Date	What Was Seen	Where Was It Seen	What Was Done

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Control: *What Should A Pest Control Company Do?*

Customer Preparation

Customer preparation is the job of the person from the pest control company who speaks with callers before doing the job. Like you, they should be knowledgeable about bed bugs, educating callers so they understand why time-consuming and thorough preparation is so important. If the company doesn't require prep work, your callers should call the next company on their list.

PMPs may ask callers to launder all clothing, bedding, and draperies, buy Ziploc bags for all possessions in drawers, closets, etc., clean rooms thoroughly, and vacate rooms on all treatment days. One thing that differs by pest-control company is whether callers should do anything to the bed ahead of time. There's no "right" way. *Still, the company should be able to explain the "why" behind their standard operating procedure.*

The time and money it takes to battle bed bugs will be easier to grasp if callers understand ...

- Clutter makes it harder for PMPs to find and treat all likely hiding spots of loner females that could restart an infestation.
- Bed bugs aren't found just in beds. Any space a credit card edge could slide in is a possible hiding spot. PMPs need to treat baseboards, picture frames, bed frames, dressers, drawers, and tables. Because preparation will disturb the bugs, callers should choose a pest control company and learn their operating procedure *before* doing much to the room.
- Remember: Chemicals don't penetrate the eggs, which take up to two weeks to hatch. The follow-up treatment is usually scheduled two or three weeks after the first treatment so newly hatched nymphs (immature bugs) can be killed before they become adults and lay more eggs. Prepare the same as for the first treatment. Callers can save time and money by unpacking only a few essentials until the follow-up is done.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Cost

Bed bug jobs take time and expertise. The service is justifiably costly. Prices vary by region and the type of contract. Call around to get an idea of prices in your region. \$500 or more for the first visit and treatment and \$250 for the follow-up aren't unreasonable. It might even be cheap for an area. If a caller shops around and finds a company that offers service at a much lower price, chances are their services are less thorough.

Treatment

Technicians who inspect and treat should be able to answer questions about bed bug biology and behavior as well as explain their plans.

Even if someone has already come to inspect and quote the job (some companies will quote over the phone, others inspect first and quote at that visit), technicians should *always* inspect before treating. At the very least, they should use a flashlight when inspecting. Proper inspection takes time and should not be rushed.

And what's their plan for treatment? If it's to treat least-infested areas first, working toward most-infested areas, the plan is good. PMPs should use a range of formulations and methods, both liquids and dusts. The PMP should target cracks, crevices, and behind electrical sockets. Not every company uses a vacuum or steamer—that might be the caller's job. Vacuuming just before the PMP arrives will get dirt out of cracks so the treatment can get in. The PMP must take care not to spread the problem. Anything that needs to be removed from the treatment area should be covered. Once an area has been treated, only treated items should be moved back in.

If people or pets are present, for safety's sake they should be in a different room. Do not enter a room that has been treated for at least 4 hours. Children's and sick people's mattresses shouldn't be treated.

A note on fumigation—it's costly, but effective. We're not talking foggers or "bug bombs," fumigation requires special licensing. One fumigation will kill eggs, nymphs, and adults. The options are whole building or container. For bed bugs, whole-building will ensure that bed bugs are gone.

Follow-Up Treatments

Count on at least one follow up treatment, bed bugs should be gone after 2-3 visits. Unless the structure is fumigated (this is different from bombing!), one visit won't get rid of bed bugs. Follow-up treatments should still include inspection of all previously suspect areas, followed by treatment.

...

Because complete elimination is hard to achieve for any pest, most bed bug contracts don't guarantee it. Plus, there's no way to tell between a bed bug from a previously treated infestation and one that's come in recently. Companies with a good business sense can't guarantee bed bug work for a long period of time. This doesn't mean the company won't go to great lengths to help the caller. And yes, it *is* possible to eliminate bed bugs from a home.

Control: *Non-Chemical D.I.Y. Treatment Options*

Some people are determined not to call a PMP. Here's what you can tell them:

- **Vacuuming:** *A vacuum is not a stand-alone solution.* But it will suck up bed bugs and, used frequently, help keep their numbers down. The narrowest attachment should be used along seams, cracks, and crevices. There's *no* guarantee it'll suck all bed bugs out of hiding. Nor will eggs reliably be removed from surfaces they're cemented to. Immediately after, the bag or canister should be removed. Bed bugs in that bag will still be alive! Put the bag or canister contents into a plastic bag, freeze for an hour to kill most of the bed bugs, then dispose of properly. Canisters should be washed, be sure it's unplugged! The vacuum itself should be inspected to assure no bugs remain inside.
- **Steam:** Research is under way on how well steamers work. No one's sure yet how deeply killing heat penetrates wood and fabrics. A good steamer will kill eggs, immatures, and adults on contact. But it offers no defense against reintroducing bed bugs. When using a steamer, callers should move *extremely slowly* (1 foot in 15 seconds) and methodically. Caution them against using a small nozzle that blows bed bugs away from the treatment area—they will survive. The heat needed to kill bed bugs will burn skin. Manufacturer's instructions take priority over any that the caller has heard. Afterward, *let things dry completely.* This prevents moisture or mold damage. *Steam can carry electricity.* Stay away from switch plates, electrical outlets, and plugged in appliances.
- **Heat:** Extreme heat will kill bed bugs. One hour in a dryer on a heat cycle (the hotter the better) kills eggs and insects. If taking stuff to a laundromat, sort at home and put loads in a bag—dispose of the bag (tie off the top) once empty. Don't use the same bag to bring clothes back. Dry cleaning kills bed bugs, but the cleaner should be warned that the item might be contaminated. If the clothes won't be damaged by heat and stains won't set, put them in a dryer before going to the dry cleaner.
- **Blankets, pillows, some shoes, children's plush toys, curtains, rugs, seat cushions, and fabric bags** can be in a hot dryer even if they don't get washed. If the item can survive heat and tumbling and it won't damage the dryer, it can go in a dryer. Suggest callers check the lint filter for bed bugs afterwards. It's another way to confirm their presence.
- **Freezing:** More research is needed on how well freezing works. Suggest that items be quickly exposed to 32 °F or below and left in the cold for at least two weeks. This will kill the crawling ones. Eggs will be dead after 30 days of being frozen.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Control: *What Doesn't Work*

Putting the legs of the bed frame in kerosene or coating them with petroleum jelly.

Bed bugs have been known to climb on the ceiling and drop down onto the bed. Plus kerosene is a fire hazard.

Thyme Oil.

Thyme oil may discourage bed bugs, but it won't kill them. Chances are it'll spread, not fix, the problem.

Leaving the home unoccupied through a winter.

Bed bugs have adapted to the unpredictable habits of humans. If given time to go dormant—for example, in a vacation cabin that slowly gets cooler, then cold over fall and winter—bed bugs can survive, living without a meal for many months while waiting for humans to return. The quick penetration of killing temperature is the key to any temperature treatment.

Turning up the heat.

Exposing bed bugs to 120 °F or more for two hours will kill all life stages— and whole-structure or “container heat treatments” do work. But the caution is similar to using cold. High heat must be maintained at *every point* in the building: the outer walls, deep in the sofa, etc. for the full hour. Professionals enclose the structure, using tools to guarantee that it reaches the right temperature.

If they go with a full-structure heat treatment, callers should consider if the heat could damage furniture, appliances, and belongings.

Sleeping with a light on.

Bed bugs feed when hosts are inactive. *Usually* that's when it's dark—but they'll feed under lights if they're hungry.

Sleeping in a different room.

Bed bugs will move to a neighboring room if they can't find food. And they can live months between meals. Sleeping in a different room, staying at a hotel, or moving in with friends should be discouraged. It won't solve the problem. And the chances of carrying the bugs to a new place are good. Tell them to keep sleeping in their beds, much as they hate the idea. If callers have awful reactions to the bites, have them *try* to get *someone* to sleep in the bed.

Buying a new mattress.

Buying a new mattress won't solve the problem. Bed bugs hide in more than just mattresses. New mattresses might be transported in the same trucks that pick up used and possibly contaminated ones. Recommend a bed bug-proof mattress and box spring encasement, kept in place for 1.5 years. This will starve them. The caller should inspect often for torn spots in the encasement. If callers want a new mattress, suggest they treat once, encase the mattress and box spring, then purchase new after eliminating bed bugs.

Wrapping items in black plastic and leaving in the sun.

Not reliable.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Types of Callers and Their Worries

Bed bugs can infest or be carried on anything. Thinking about this can drive a person mad. But a few measures go a long way toward preventing their spread:

- Inspect when practical.
- Hotel rooms (headboards, bedside tables and piping on mattresses and box springs) and incoming mattresses and used furniture should *always* be inspected.
- As soon as they get home from any place where people come and go with luggage, callers must wash everything possible in hot water and put them in a hot dryer for at least an hour.
- Things that can't be washed can be frozen for two weeks.
- If they find bed bugs, ask if they have a laundry room. Have them inspect it.

Types of Callers and Their Worries: *Homeowners*

The home was the baseline for everything you've read so far. Flip back for review.

Types of Callers and Their Worries: *Landlords*

The question, "Who's responsible for a bed bug infestation?" has no clear answer. Laws are changing and every situation is different. Local health departments and law offices have the best answers to these questions. It's nearly impossible to place blame for a bed bug infestation in a large building, and no one is safe from bed bugs.

Encourage landlords to talk to their lawyer and include bed bugs in their contract as a preventative measure. For example, "residents will prepare their living units for visits by pest management professionals (PMP) according to guidelines supplied to them by building management and/or the PMP." The PMP should treat all rooms or units that share a wall (including directly above and below). The cooperation of every person involved will be essential. Having a plan ready can save time, frustration, and money.

Inspection should be done (with permission) often. Tenants may have frequent visitors and some units may exceed occupancy requirements. If tenants are breaking laws or contracts laws, it's not likely they'll seek help from the landlord or a pest control company, so proactive measures must be taken. Such cases can be difficult. Safety is always the #1 priority. Bed bugs aren't known to spread disease. Advise landlords not to put themselves or PMPs in danger on account of bed bugs. Anyone who inspects apartments must be cautious of sharp objects or weapons under mattresses or in furniture. They should always look with a flashlight before touching.

ALL actions taken toward prevention and control in a unit should be documented. This helps prove that precautions were taken and helps PMPs evaluate the situation.

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Types of Callers and Their Worries: *Tenants Or Dorm Residents*

The advice you can give a tenant combines the advice for a homeowner and a landlord. Tenants need bed bugs in their contract as much as landlords do. Tenants are entitled to a livable, safe and sanitary apartment. Encourage them to check their lease for the landlord's commitment to treating adjacent units (if applicable) and paying for the treatment if bed bugs are coming from another unit. Planning ahead can save time, frustration, and money.

Tenants need to prepare and inspect the way a homeowner would, but responsibility for a pest control contract and involving the neighbors will bring in the landlord. Thoughtful communication between all parties is essential.

The question, "Who's responsible for a bed bug infestation?" has no clear answer. Laws are rapidly changing and every situation is different. Local health departments and law offices have the best answers to these questions. It's nearly impossible to place blame for a bed bug infestation in a large building, and no one is safe from bed bugs.

ALL actions taken toward prevention and control in a unit should be documented. These can help prove that precautions were taken and will help professionals evaluate the situation.

Download and print a copy of NYS IPM's Bed Bug Information cards, http://www.nysipm.cornell.edu/publications/bed_bugs/files/bb_travelers_online.pdf 1.4Mb pdf file

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

Types of Callers and Their Worries: *Travelers*

Every traveler should learn about bed bugs. Some countries are taking steps to combat bed bugs (Australia is a good example). Others that never got a break from bed bugs tolerate them.

Tell callers to inspect before settling into any room, and then to wash, dry, or freeze items immediately upon returning home and before taking anything into the bedroom. The inspection should focus around the bed. The headboard is usually held on the wall with two brackets—lift up 1-2 inches then lean the top away from the wall to gain access to the back. If they can't do it alone, someone on staff should help. After checking the headboard, check sheets and pillows. Next, pull back the sheets. Check the piping of the mattress and box spring. If all these places are clear, enjoy the night. The next morning, look for blood spots on the sheets—bed bugs poop soon after they feed.

If callers find bed bugs, tell them that the evidence may be old and doesn't mean that the hotel is dirty. Tell them to tell the front desk *discreetly* what they found and ask for another room—one that doesn't share a wall with the room they just vacated. Bed bugs are a PR nightmare for the hospitality industry. If travelers run to a competitor (who's just as likely to have bed bugs) it makes it less likely that the industry will become more open about this issue. Communication is key. Ideally hotels and motels would pride themselves on their bed bug programs and show customers how to inspect to keep all parties bed bug free.

If callers found bed bugs after moving into a room, they could ask the hotel to pay for laundering all their clothing and inspecting and steam-cleaning their luggage, *ASAP*, by a pest control company. The hotel may refuse, but it's worth asking. Laundering and inspecting before luggage is unpacked in another room will help ensure that the problem doesn't spread.

Callers should also be advised not to unpack into drawers and to keep luggage closed on a luggage rack pulled away from the wall. Never set luggage on the bed.

Bed Bug Packing List

- flashlight (even the keychain LED variety).
 - gloves help prevent getting poked by sharp objects.
- Warn callers always look with a flashlight before touching.

Download and print a copy of NYS IPM's Bed Bug Information cards,

http://www.nysipm.cornell.edu/publications/bed_bugs/files/bb_travelers_online.pdf 1.4Mb pdf file

STOP THE SPREAD

- Inspect sleeping areas—if a bed bug is found, save it, STOP looking and contact a professional.
- Do-It-Yourself pest control may cause the insects to disperse.
- Launder and freeze when possible.
- Items with bed bugs should be sealed in a bag before moving them.
- Items left on the curb should be broken or torn—no one wants bed bugs!

For more information, contact

- Allison Taisey, New York State IPM Program: aat25@cornell.edu
- Carolyn Klass, Cornell Department of Entomology: ck20@cornell.edu
- Jody Gangloff-Kaufmann, New York State IPM Program: jljg23@cornell.edu

References

In addition to those previously mentioned.

- A.S. Stutt and M.T. Siva-Jothy. "Traumatic insemination and sexual conflict in the bed bug *Cimex lectularius*." *Proceedings of the National Academy of Sciences of the United States of America*. 98(10): 5683-5687. 2001
- C. Wang *et al.* "Controlling Bed Bugs in Apartments." *Pest Control Technology*. 35(11): 64-70. 2007
- D.J. Moore and D.M. Miller. "Laboratory Evaluations of Insecticide Product Efficacy for Control of *Cimex lectularius*." *Journal of Economic Entomology*. 99(6):2080-2086. 2006
- G. Morrison. "Don't Let the Bed Bugs Bite." *Units*. January: 38-40. 2006
- J. Goddard "Bed bugs bounce back—but do they transmit disease?" *Infect Med*. 20:473–4. 2003
- M.F. Potter. "Bed Bug State of Mind." *Pest Control Technology*. 33(10):82-97. 2005
- M.F. Potter. "Your guide to bed bugs: understanding and control." *Pest Control Technology*. 32(8): 2004
- N. Hinkle. "Delusory Parasitosis." *American Entomologist*. 46(1):17-25. 2000
- R.D Kramer. "Closing in on bed bugs." *Pest Control Technology*. 32(11): 62-64, 66-68. 2004
- S.L. Doggett *et al.* "Encasing Mattresses in Black Plastic Won't Provide Thermal Control of Bed Bugs, *Cimex spp.*" *J. Econ. Entomology*. 99 (6): 2132-35. 2006
- S.W. Hwang *et al.* "Bed Bug Infestations in an Urban Environment." *Emerging Infectious Disease*. 11(4): 533-538. 2005