

Guidelines for the Prevention and Control of Bed Bugs in Df]bW hcb' 6cf ci [\#Hck bg\]d'



Public Health
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Princeton Reg. Health Dept.

Princeton Regional
Health Department
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Bed Bugs in Df]bVhcb?

Recently, there has been a noticeable resurgence of bed bug infestations across the United States, including areas of Rtlpegqp. Because of the extent of this problem, personnel from the tgi kpcnhealth department have produced these guidelines to assist residents and property owners with surveillance, management and control of bed bug infestations. Bed bug infestations can occur in an array of settings including apartment complexes, single-family homes and office buildings. Like many other health-related topics, minimizing the risk of a severe bed bug infestation involves prevention and early detection. Once infestations have become extensive, eliminating the problem can prove extraordinarily difficult. Understanding basic bed bug behavior can go a long way towards recognizing infestations in their infancy or preventing problems altogether.

Bed Bug Basics

Bed bugs are thin, brown oval-shaped insects that are roughly the size of a tick. Upon hatching from an egg, bed bugs molt several times, each time increasing in size and gradually becoming darker in color. All stages of growth require a blood meal, and both male and female bed bugs bite. Bed bugs move from place to place by “hitchhiking” in items such as luggage, backpacks, furniture, mattresses and personal belongings.

Bed bugs are nocturnal insects. Although they can be seen during the day, they generally feed at night. They commonly hide in the crevasses of furniture, picture frames, mattresses and other household items. Most bed bug infestations start at the point nearest a blood source—generally the bedroom. As infestations grow, bed bugs can eventually infest other areas of the



Adult and nymphal bed bugs



Bed bug eggs (left) and an adult bed bug (right)

home including kitchens, bathrooms and hallways. Bed bug infestations are not caused by poor sanitation. However, untidy, cluttered environments and failure to detect an infestation can cause the problem to become much worse over time.

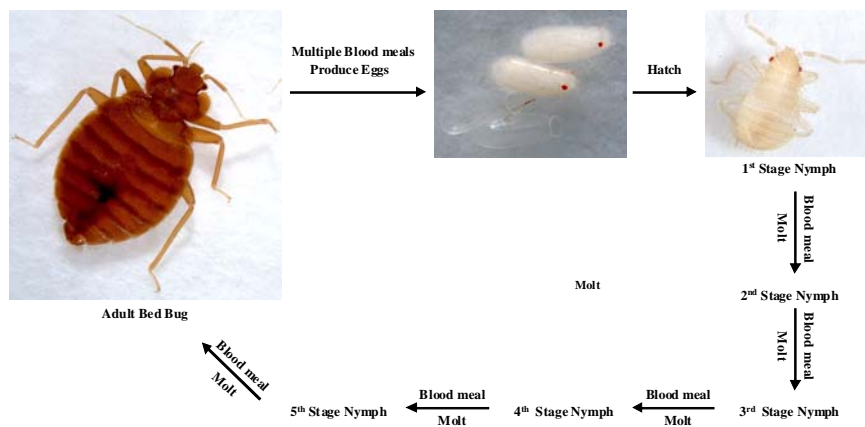
Bed bug bites appear in a variety of ways. Some bites take the form of a rash and become swollen while others do not. Because individuals gradually get bitten over the course of weeks and months, older bites tend to take on an appearance of scabbing. Both nymphs and adult bed bugs require blood. If a host is not present, bed bugs can survive for long periods without a blood meal. This varies with stage of growth—nymphs can survive without blood for a month whereas adults can survive for several months. Under optimal conditions bed bugs can complete a life cycle within two months.



Bed bug bites

The Bed Bug Life Cycle

When bed bugs consume blood it enables the insects to grow and produce eggs. After hatching, the young bed bugs (known as “nymphs”) take a blood meal and then proceed to molt. Nymphs progress through several similar stages, each time taking a blood meal and becoming larger in size. The adult bed bug is the final stage of growth. At this point the insect is mature. Adult males and females mate, and the females gradually produce eggs. Females can live for several months and feed multiple times. Each intake of blood helps to produce eggs. Nymphs tend to live no more than a month. The time spent in each stage of growth depends on conditions within their environment. In a mature infestation, all stages of growth can be found, including eggs. When conditions become unsuitable, bed bugs generally do not die. In many cases, mature insects can go weeks if not months without access to a routine blood meal.



Housing Regulations

Responsibilities of owners and tenants for controlling bed bug infestations are covered by the New Jersey Administrative Code Title 5, Chapter 28 (NJAC 5:28-1.12 f,k). Both parties are considered to have a level of responsibility in mitigating bed bug infestations.

To summarize, tenants are responsible for keeping their dwellings in a clean and sanitary condition. Should an insect infestation be restricted one dwelling, occupants are responsible for eradication within this dwelling. In most cases involving bed bug infestations, more than one dwelling will be infested simultaneously. When two or more dwellings are infested within a multi-dwelling unit, it is the owner's responsibility to maintain a reasonable insect proof condition. This could involve eradicating insects within the common areas that connect dwellings.

If tenants suspect they have a bed bug infestation they should:

- Report the infestation to the owner or landlord as soon as possible
- Cooperate with recommendations from the owner and PCO to prepare rooms for bed bug treatment and inspection
- Ensure that all furniture and other items brought into the property are free of bed bugs by inspecting the items thoroughly
- Cooperate with the owner of the property if temporary relocation is required while the infested areas of treated or inspected by a PCO

Guidelines for Property Owners and Property Managers

When confronted with a bed bug infestation, owners and managers of multi-unit dwellings should not attempt to eliminate the infestation prior to assessment by a licensed pesticide control operator (PCO). Owners should hire only PCOs that offer bed bug control as one of their services. In areas where a heavy infestation is known to exist, it is imperative to examine contiguous dwellings in order to completely grasp the magnitude of the problem. Short of this, owners will likely find themselves woefully unsuccessful at achieving eradication or even substantive control. Because of the elusive nature of these insects, control and general surveillance can be a time consuming and expensive task. Educating staff to identify bed bug problems and notifying PCOs promptly will allow for greater success in eliminating the problem. Although initial costs can be high, early detection is critical to long term success and eradication.

Unlike other household pests, bed bugs are not readily attracted to baits and traps, so conducting general surveillance and gaining a complete understanding of infestation levels can be surprisingly challenging. Traditional bed bug control has relied on the use of residual insecticides, with the idea that when contacting these chemicals the insects will gradually die. This approach by itself is generally ineffective. A more comprehensive and systematic approach is required, and this starts with basic surveillance. In a multi-dwelling setting, one should assume that an infestation is not an isolated one. Bed bugs readily travel between rooms, so the first step is to assess the extent of the infestation. In some cases this will require a survey of every dwelling. At the very least, any dwelling in contact with the initial area of known infestation needs to be evaluated.

Once the extent of the infestation is determined, eradication efforts can start. Most PCOs provide their customers with a series of sanitation requirements that must be followed prior to the application of any insecticide. Such tasks will involve removal of clutter and furniture so that the PCO can properly access bed bug infested areas. In some cases furniture and other items will need to be discarded. Owners should work directly with PCOs to ensure these procedures are followed.

Bed bugs can be killed by a variety of approaches, including steam-cleaning, residual insecticide applications and fumigation. Generally, a combination of approaches will be required. Whatever the case, eradication procedures will be only as effective as the initial sanitation and surveillance efforts allow. If, for example, contiguous dwellings are not evaluated prior to control efforts in an infested dwelling, one should not expect effective bed bug control. Regardless of the control methods employed, most eradication efforts will require multiple treatments.

Guidelines for Pest Control Operators

In most cases, PCOs will be needed to successfully manage a bed bug infestation. To do so requires an integrated approach. First, the PCO must properly identify the species of insect causing the infestation. Although rare, other insects can cause infestations similar to bed bugs. Once the problem has been correctly determined the PCO should:

- Train owners and staff to recognize and properly inspect for bed bugs
- Provide a written plan for controlling the infestation
- Inspect infested rooms as well as adjacent rooms for bed bug presence

The PCO should also recommend to the tenant and owner that non-insecticide methods be completed prior to use of insecticides. This will not only allow less chemical usage, it will allow more complete access to bed bug habitat and provide maximum benefit when an insecticide is used. In some cases, non-chemical approaches will be more effective than chemical use. These steps include:

- Maintaining intensive, sustained sanitation and surveillance
- Steam cleaning
- Washing areas of concern with household cleaning agents
- Laundering clothes in hot water and drying clothes at high heat
- Cleaning “knickknacks” in infested areas (this includes such items as pictures frames, which serve as harborage for bed bugs).
- Discarding severely infested furniture.
- Cleaning and then incasing mattresses in bed bug-proof covers

After having followed these steps, insecticide applications might be needed. Use of insecticides should be conducted by NJDEP-licensed PCOs only. Products used must be labeled for bed bug control and application rates and practices must be consistent with the product label. The PCO should also consult the New Jersey Pesticide Control Regulations (New Jersey Administrative Code, Title 7 Chapter 30) to ensure all insecticide application rules are followed properly.

In some cases, bed bugs will infest walls and soffits by gaining entrance through electrical outlets and other openings in the wall. Infested walls can be located by observing bed bugs in these areas or by using dogs that are trained to locate bed bugs. In such circumstances, insecticides can be applied inside of the wall. This is generally accomplished by drilling holes between wall studs and applying dust formulations. As with other insecticide use, such procedures should be conducted by trained professionals.

For a variety of reasons, residual insecticide treatments and non-chemical methods may never provide effective bed bug control. Such circumstances offer limited alternatives, one of which is fumigation. Although costly and labor intensive, fumigation will kill all stages of the insect. Fumigation can offer less chemical exposure to those affected by bed bugs. In areas where severe insecticide resistance exists or in dwellings where insecticide treatments are otherwise ineffective, fumigation poses an alternative. PCOs should consult fumigation experts in advance to fully explore this possibility. This approach is often excluded at first glance because of up-front costs. Fumigation will require expertise in the specific fumigant to be used, so PCOs should contact the manufacturer to ensure all necessary training is attained in advance.

Training Guidelines for Service Personnel of Hotels, Motels and Camps

Owners and managers should provide training to all staff members on bed bug surveillance, control and prevention. Training should be provided upon the start of employment and annually thereafter. Elements of a training curriculum should include:

- Identification of bed bugs and explanation of their life cycle
- Review of inspection procedures for rooms. A checklist should include:
 - Seams of mattresses, bed frames, baseboards, furniture and windowsills
 - Cracks and crevices in the room, including the floors and within picture frames
 - Areas under peeling, chipped or bubbled paint and wallpaper
- Review of housekeeping and maintenance procedures, including vacuuming and appropriate disposal of waste
- Review of reporting and referral procedures subsequent to detection of bed bugs or evidence of an infestation
- Review of prevention and control measures aimed to reduce bed bug populations and limiting their spread within the facility.

Service personnel should be on the look out for signs of bed bugs. Steam cleaning and maintaining a routine of thorough sanitation will not only kill bed bugs, it will provide the best opportunity to notice bed bugs before the infestation becomes severe. In areas of known infestations, mattresses and box springs should be encased in bed bug-proof covers. This will reduce the available shelter for bed bugs. Clothes and beddings should be laundered in hot water and dried at high heat. Severely infested furniture should be discarded.

Guidance for Tenants: Take Positive Steps to Prevent Bed Bug Infestations

DO

- Report any bed bug sightings or infestations to the property manager or landlord immediately
- Keep your personal belongings organized and prevent accumulation of clutter
- Keep your dwelling clean and in a sanitary condition - clean frequently with common household cleansers
- Vacuum your dwelling often. Focus on the edges where the floors and walls meet. Discard vacuum bags immediately and remove trash from the dwelling
- Report or repair damaged wall surfaces like curling wall paper, cracking or chipping paint, damaged plaster, etc.
- Allow access to your dwelling for pesticide treatments when required
- Require house guests to inspect their occupied space frequently.
- Regularly inspect your dwelling for signs of bed bugs or bed bug activity
- Encase your mattresses and box springs with covers that prevent bed bugs from becoming established in the bed

DO NOT

- Take bed bugs lightly. They are a menace and negatively affect quality of life for everyone
- Pick up discarded furniture from the side of the road
- “Dumpster Dive.” Furniture in dumpsters can contain bed bugs or bed bug eggs
- Bring any second hand furniture into your residence that has been purchased at a yard sale or consignment shop without carefully inspecting it for signs of bed bugs
- Purchase second hand mattresses unless they are certified bed bug free
- Move your belongings to another dwelling without thoroughly cleaning and inspecting every item completely

**For More Information or to
Report a Bed Bug Complaint**

Please contact:

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