

Bed Bugs

An Informational Pamphlet



Warren County Combined Health District

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“Sleep Tight-Don’t Let the Bed Bugs Bite”

We all grew up hearing the above phrase and not thinking much about the actual “bed bug” being referred to in it. Bed bugs are parasites whose preferential food is human blood. Bed bugs were once a common public health pest worldwide, but declined in incidence through the mid 20th century, primarily due to the use of DDT. Recently however, bed bugs have undergone a dramatic resurgence and worldwide there are reports of increasing numbers of infestations. Locally we first began hearing about bed bugs being a problem in the urban areas, such as Cincinnati, Ohio several years ago. Then we began to receive complaints of bed bug problems in area motels. Now we receive several calls a week regarding bed bugs in apartments and homes. While many people associate bed bugs with unclean or unsanitary conditions, the problem may be found in the cleanest of homes, hotels, or other buildings.

The purpose of this informational brochure is to provide the knowledge that property owners, tenants, landlords, and hotel managers will need should they learn that they have a bed bug problem in their home, apartment or hotel room. This brochure will provide information on the biology and health significance of bed bugs, offer guidance on inspecting for bed bugs, and provide information on how to safely and effectively manage an infested residence or hotel room. It will also discuss who is responsible for treatment of a bed bug problem in rental situations according to the Warren County Combined Health District Housing and Premise Maintenance Code.

Biology of the Bed Bug

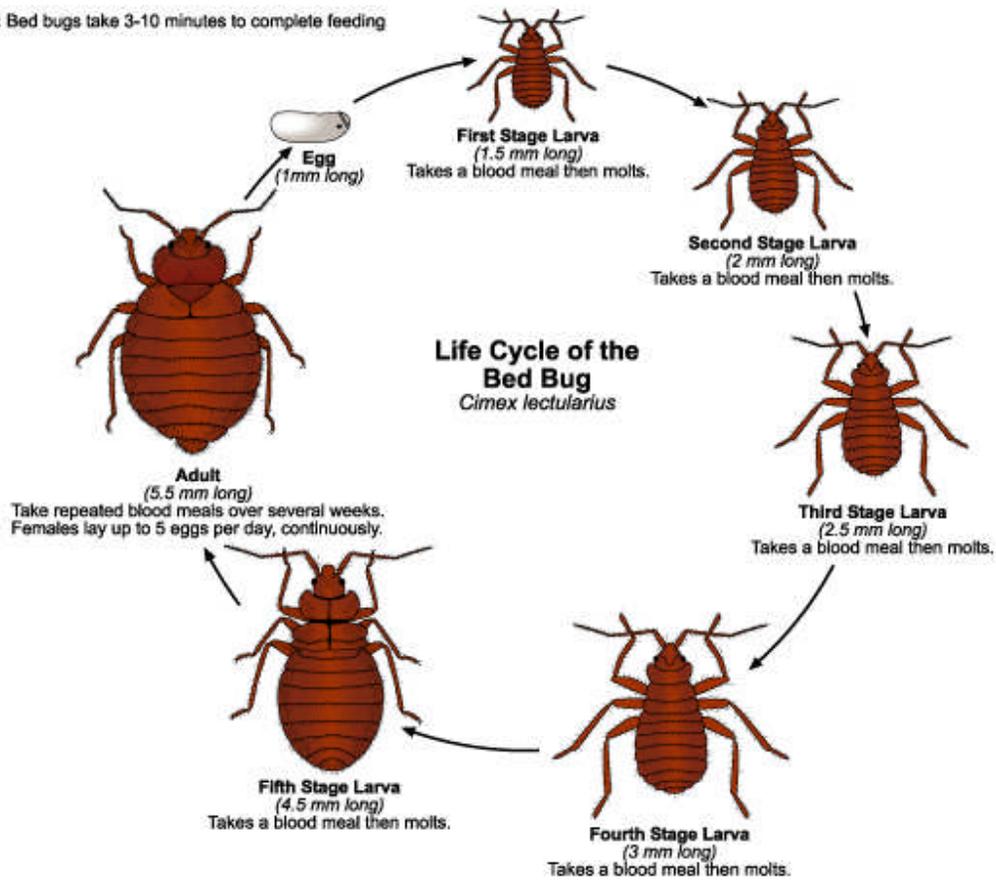
Bed bugs are small wingless insects that feed solely upon the blood of warm-blooded animals. They are sometimes mistaken for ticks or cockroaches. A mature bed bug is oval-bodied, brown to red-brown in color, wingless, and flattened top to bottom. Unfed bugs are $\frac{1}{4}$ to $\frac{3}{8}$ inches long and the upper surface of the body has a crinkled appearance. A bed bug that has recently fed is engorged with blood, dull red in color, and the body is elongated and swollen. Eggs are white and are about $\frac{1}{25}$ th of an inch in length. Newly hatched bed bugs are nearly colorless or straw-colored.



Adult Bed Bug

Bed bugs require blood in order to reproduce and complete their life cycle. Female bed bugs deposit 3-8 eggs at a time with a total of 200-500 eggs being produced by a single female over her lifetime of 10 months. The eggs are deposited in clusters and fastened to cracks and crevices or rough surfaces near where the adult's harborage areas with sticky cement-like substance. The eggs hatch in 4-12 days. The newly hatched nymph is nearly colorless or straw-colored before feeding, and then turns red or purple in color after taking a blood meal. Bed bugs go through 5 nymphal stages before reaching maturity. This usually takes 35-48 days. Bed bug nymphs can survive without feeding and adult bed bugs can survive for 6-7 months without a blood meal. They have been known to live in abandoned houses for at least a year.

Note: Bed bugs take 3-10 minutes to complete feeding



Habits

Bed bugs are fast moving insects that are nocturnal blood-feeders. They feed mostly at night when their host, usually human, are asleep. After using their sharp beak to pierce the skin of a host, they inject a salivary fluid containing an anticoagulant that helps them obtain blood. Nymphs may become engorged with blood within three minutes, whereas a full-grown bed bug usually feeds for ten to fifteen minutes. They will then crawl away to a hiding place to digest the meal. Bed bugs do not have nests like ants or bees, but they do tend to congregate in habitual hiding places. They seem to prefer fabric, wood, and paper surfaces. They usually hide in close proximity to where their host sleeps, although they can travel fair distances to feed if necessary. Bed bugs can initially be found in tufts, seams, and folds of mattresses, later spreading to crevices in the bed frame itself. In heavier infestations, they also may occupy hiding places farther from the bed, such as window and door frames, electrical boxes, floor cracks, baseboards, furniture, and under the tack-strip of wall-to-wall carpeting. Bed bugs often crawl upward to hide in pictures, wall hangings, drapery pleats, loosened wallpaper, cracks in plaster, and in ceiling moldings.



Evidence of Bed bugs on mattress.



Bed bugs hiding in mattress seam.



Bed bugs in carpeting.

Public Health Significance of Bed Bugs

While at least 27 agents of human disease have been found in bed bugs, including viruses, bacteria, protozoa, and parasitic worms, there is **no evidence** that bed bugs have ever been involved in the transmission (via a bite or from infected feces) of any disease agent, including hepatitis B virus and HIV, the virus that causes AIDS. The actual bite of the bed bug is painless. The amount of blood loss due to bed bug feeding typically does not adversely affect the host. Unlike flea bites, which occur mainly around the ankles, bed bugs feed on any bare skin exposed while sleeping (face, neck, shoulders, arms, hands, etc.) Skin reactions are commonly associated with bed bug bites, which results from the saliva injected during feeding. Usually, if there is any infection, it is a result of the host scratching the bite area and infecting the wound. Common allergic reactions include the development of large welts, often larger than 1 cm, which are accompanied by itching and inflammation. These welts usually subside to red spots but can last for several days. Blister-like eruptions have been reported in association with multiple bed bug bites and anaphylaxis may occur in patients with severe allergies. So, while bed bugs have never been proven to biologically transmit any human pathogen, we health officials are concerned with infestations due to the possibility of secondary infections.

Inspecting for Bed Bugs

When bed bugs are suspected, a thorough inspection should be undertaken in areas where people sleep or rest. If the suspected infestation is in a motel environment, then housekeeping staff should be interviewed as they are likely to have detailed knowledge about signs of an infestation. Because bed bugs can hide in virtually any crack and crevice, you should inspect any dark, isolated, and protected areas in the vicinity of the sleeping area. Bed bugs prefer wood, paper, and fabric surfaces and these materials should receive special attention during the inspection process. The mattress should be the first site inspected and the seams, beading, under buttons, labels, and corner protectors should be examined closely. In a motel environment, the headboard is often attached to the wall. The headboard should be removed and inspected behind in this case. Tell-tale signs of a bed bug infestation can be recognized by blood stains from crushed bugs or by rusty spots of excrement on sheets and mattresses, bed clothes, and walls. Fecal spots, eggshells, and shed skins may be found in the vicinity of their hiding places. Sometimes, if the infestation is heavy, there is an offensive, sweet, musty odor from their scent glands may be detected when bed bug infestations are severe.

The areas around the bed should be investigated next, including the bedside furniture. The drawers in dressers should be removed and examined. Other furniture in the room should be inspected as well as any electronic devices in the room, such as clock radios, stereo equipment, etc. You should also inspect books, electrical outlets, base board, loose wall paper, picture frames and wall mirrors. In the case of a motel or an apartment complex, the inspection should extend to any adjoining rooms within 20 feet of the sleeping area. While bed bugs can travel over 100 feet in one night, they tend to live within 8 feet of where people sleep.

Treatment and Control of Bed Bugs

If bed bugs are found you should contact a licensed pest control professional, though this is not required by code. There are a number of effective over-the-counter chemicals available for the control of bed bugs. If you decide to use a pest control professional you should ask the pest control professional to provide you with a written integrated pest management plan that will detail the methods and insecticides to be used by the pest control operator and outline responsibilities of the owner, apartment management, the tenant, or the motel management. Control and elimination of bed bugs will require the use of insecticides applied in conjunction with non-chemical means of control. Non-chemical means of control can range from cleaning, vacuuming, doing laundry, placing mattresses in zippered mattress covers to removal and disposal of heavily infested mattresses and furniture. In Warren County, Ohio we require that in the case of a multi-family building where there are two or more apartments with a bed bug infestation, the owner or landlord is responsible for either bringing in the licensed pest control professional or for treating themselves both the apartments infested as well as any adjacent apartment within 20 feet of the infested apartments sleeping area. The tenants are responsible for cooperating with the apartment management regarding access to their apartments for pesticide application as well as any physical control measures recommended by the pest control professional or the health department. These can and will include cleaning and vacuuming the apartment, enclosing mattresses in zippered mattress covers, treatment of mattresses with pesticides approved for that use, or disposing of mattresses and furniture.

The Warren County Combined Health District Housing and Premise Maintenance Regulation specifies the following regarding responsibility for treatment of a dwelling unit:

“Every occupant of a dwelling containing a single dwelling unit shall be responsible for the extermination of any insects, rodents, or other pests therein or on the premises. Whenever the infestation exists in one or more of the dwelling units in any multi-family dwelling, or in the shared or public parts of any multi-family dwelling, extermination thereof shall be the responsibility of the owner. All pest control will be carried out following the applicable laws for pesticide application in the State of Ohio. The time period for pesticide application to continue shall be determined by the Health Commissioner, based on the seriousness of the infestation, the life-cycle of the pest, and the results of the previous application. Pests subject to this regulation shall include, but shall not be limited to, mosquitoes, cockroaches, flies, fleas, bedbugs, etc.”

While some over-the-counter pesticides can be effective against bed bugs, it is still recommended that you bring in the licensed pest control operator to treat for bed bugs. Owners and occupants of infested apartments or homes are urged to follow the specific directions on the label of the pesticide they have purchased and to use the pesticide safely. Never use pesticides approved for outdoor use inside the home.

If you choose to dispose of your furniture or mattress, you must wrap the furniture or mattress in plastic sheeting and seal it with tape. If the items are not wrapped and tape-sealed, most refuse haulers will not pick the item up. One of the ways that bed bugs are spread from home to home is people picking up furniture that has been set out for refuse pickup and reusing the furniture in their own home. By wrapping the furniture or mattress in plastic, hopefully the individual, who might have taken the item for reuse, will recognize there is a problem and leave it for the refuse hauler.

The most effective chemical control of bed bugs must be completed by a licensed pest control professional. Residual insecticides (usually pyrethroids) are applied as spot treatments to cracks and crevices where bed bugs are hiding. Increased penetration of the insecticide into cracks and crevices can be achieved if accumulated dirt and debris are first removed using a vacuum cleaner. Remember to dispose of the vacuum cleaner bag once you have used it for this purpose. Avoid using highly repellent formulations, which may cause bed bugs to scatter. Dust formulations may be used to treat wall voids and attics. Repeat insecticide applications if bed bugs are present two weeks after the initial treatment since it is difficult to find all the hiding places and hidden eggs may have hatched.

Many licensed pest control professionals are now using heat treatment to kill bed bugs and this is a viable alternative to the use of pesticides.

Do not use any insecticide on a mattress unless the product label specifically mentions such use. Very few insecticides are labeled for use on mattresses. If you are using an appropriately labeled insecticide on a mattress, take measures to minimize the pesticide exposure to the occupants. Apply the insecticide as a light mist to the entire mattress, opening seams, tufts, and folds to allow the pesticide to penetrate these areas. Allow the treated surface to completely dry before use. Do not sleep directly on the treated mattress. Be sure that bed linens are in place or place the treated mattress inside a zippered mattress cover. Never treat mattresses of children or people who are ill. Bed linens should never be treated with an insecticide. Instead, they should be either dry-cleaned or washed in hot water and dried using the “hot” setting.

If you have any questions regarding bed bugs or this informational brochure, please contact our Environmental Health Division at 513-695-1220, 513-261-1220, 937-425-1220, or 513-925-1220.



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