



Bed bug adult

Photo: G. Snodgrass, VID, APHC

What are bed bugs and where are they found?

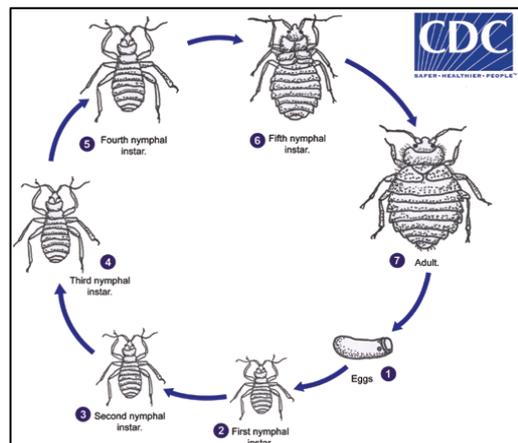
Bed bugs (*Cimex lectularius*) are insects that have cohabitated with humans throughout history. Bed bugs were essentially eradicated in the United States and many European countries through the use of the insecticide DDT. However, bed bugs have undergone a dramatic resurgence beginning in the 1990s. Worldwide, bed bug populations have been increasing, which is thought to be due to several factors including increased international travel, pesticide resistance, and a lack of bed bug awareness. Knowledge of bed bugs is the key to reducing the spread of populations.

What do bed bugs look like?

Adult bed bugs are flat, oval-shaped, wingless insects approximately 1/4 to 3/8 inch long and rusty red or mahogany in color. Newly hatched bugs (called “nymphs”) appear similar to adults but are much smaller and nearly colorless.

Bed bugs grow by shedding their skin (molting). Each nymph must have a blood meal to molt to the next stage. Bed bugs feed every 5–7 days if a host is present, but can survive extended periods without feeding.

Female bed bugs lay their eggs in secluded areas, depositing up to 500 eggs throughout their lifetime. There are several closely-related species that can be misidentified as bed bugs, including the eastern bat bug (*Cimex adjunctus*) and western bat bug (*Cimex pilosellus*). These species require bats to reproduce, but in the absence of a bat host, they may feed upon humans. However, since humans are not the preferred hosts, reproduction is unlikely to occur.



Bed bug life cycle: nymphs need to feed on blood to grow. Diagram: CDC

What are the signs and symptoms of a bed bug infestation?

Bed bug infestations are often difficult to identify early due to their cryptic nature. Bed bugs commonly live in inaccessible areas, such as behind the headboard, tufts and seams of the mattress, and inside the box spring. It should be noted that bed bugs will harbor wherever hosts spend a significant amount of time, sofas, recliners, and other such furniture are commonly infested as well as beds. They are highly mobile and often move beyond the bed area to other rooms. In heavier infestations, bed bugs can be found hiding along, inside, or behind: edges of carpeting, baseboards, window- and door-casings, pictures, moldings, loosened wallpaper, cracks in plaster and partitions, furniture, and electrical outlets. The area behind the headboard is often the first place that the bugs become established. Look for black and brown spots of dried excrement. These can help pinpoint bed bug harboring areas. Shed skins are often found in conjunction with dried excrement and eggs. Occasionally, engorged bed bugs get smashed on bed linens leaving blood smears. Heavily infested areas may have a distinctive, sweetish odor.

How do I get bed bugs?

Bed bugs are expert hitchhikers, often stowing away in unsuspecting hosts' luggage, purses, boxes, furniture, and other belongings. Although bed bugs are wingless and cannot fly, recent research shows that bed bugs will quickly move throughout a structure and relocate to adjacent rooms. Once inside a dwelling, bed bugs hide in cracks and crevices close to areas where people sleep. Bed bugs are becoming common in non-traditional areas like offices, theaters, clothing stores, hospitals, and any other place where people gather. Because people are not always available to feed on in these areas, bed bugs will migrate in search of hosts, which makes an infestation more difficult to identify and manage.

Do bed bugs pose a health risk?

Bed bugs usually feed at night when people are asleep. They may bite anywhere on a human body, especially on exposed sites around the face, neck, upper torso, arms, and hands. It is a myth that bed bug bites always come in sets of three. Individual male and female bed bugs need 3–15 minutes to feed. Bed bugs feed mainly on the blood of humans, but also suck blood from other animals including birds and bats. While there is currently no evidence suggesting that bed bugs can cause disease, the bites themselves could become infected after scratching, so suspected bites should be thoroughly cleaned/disinfected. Bed bugs can have a psychological impact, especially since they feed when it is dark and during the vulnerable sleep period. This can lead to anxiety and sleeplessness which can last long after a bed bug infestation has been eliminated. If judicious and thorough management measures are implemented, this type of anxiety can be reduced.

How can I prevent a bed bug infestation?

The key to preventing a bed bug infestation is education. You can reduce your chance of infestation by knowing what to look for and how to limit the ability of a bed bug to hitchhike home with you. Avoid acquiring rental or secondhand furniture, or, examine these items carefully before bringing them into your home. Reduce household clutter and vacuum frequently. If travelling, conduct an inspection of the room as soon as you arrive. If any evidence of bed bugs is present, notify management and request a different room. Keep luggage on racks or otherwise off the floor. Inspect the luggage prior to repacking. Upon returning home, launder all clothing using the highest heat settings for washing and drying for at least 30 minutes. Bed bug eggs, nymphs, and adults will be killed when exposed to temperatures of 115° F (46° C) for 15 minutes. Launder luggage if possible, otherwise examine it carefully under bright light. If bed bug evidence is detected, determine a treatment option appropriate for the size and type of luggage. Proactive measures can go a long way in preventing bed bug infestations in the home. When in public places, such as theaters and libraries, be aware of the potential for bed bug exposure.

How are bed bugs infestations treated?

Nonchemical Approaches: Contact preventive medicine services at your supporting military health clinic to identify a suspected bed bug found in your home. Proper identification is essential to establish an effective management strategy.



Top: Bed bug adult, nymphs and eggs with dried excrement. **Bottom:** Adult bed bugs with fecal material on fabric.
Photos: Dr. H. J. Harlan

Inspect your mattress, box spring, bed frame, and headboard using a bright flashlight. Pay particular attention to folds, seams, crevices, joints, and screw holes. Look not only for bed bugs but for shed skins, feces, and eggs. Vacuum all the crevices on your mattress, bed frame, baseboards and any suspected locations. Use a brush or crevice attachment with a scraping motion to dislodge bed bugs or eggs. Remove the mattress and box spring from the bed frame and inspect and vacuum all surfaces, removing all loose debris and visible bed bugs. Flip the bed frame over and vacuum any crevices where bed bugs may hide. Repeat the above for any location where people have been sleeping/resting including sofas, fabric-covered chairs, and recliners. Dispose of vacuumed contents in a sealed plastic bag. Launder all linens using the highest heat settings for washing and drying. Cover the mattress and box spring with a quality bed bug-impermeable case or cover. Encasing both mattress and box spring eliminates the need to discard bedding by trapping potential bed bugs inside. It also provides a smooth outer surface that can be inspected, vacuumed and cleaned easily.

Although heat and freezing can be used to kill bed bugs, these treatments should be conducted by pest management professionals to ensure they are both safe and effective.

Chemical Approaches: While active infestations of bed bugs can be effectively treated with pesticides, few chemicals provide effective long-term control, and preventive applications of pesticides for bed bug control are not recommended. Confirmed infestations should be treated by a pest management professional using pesticides targeting the cracks and crevices of dressers, wooden bed frames and headboards, door and window trim, baseboards, and similar sites. If applying pesticide yourself, always follow the directions on the pesticide label to ensure safety of occupants. If living on a military installation, always contact the residential housing office, who will coordinate pest management services with the Installation Pest Management Office.

Where can I find more information on Bed Bugs?

Armed Forces Pest Management Board Technical Guide 44, Bed Bugs – Importance, Biology, and Control Strategies. March 2012. <http://www.afpmb.org/sites/default/files/pubs/techguides/tg44.pdf>