

Greater London Pest Liaison Group
Good Practice Guide



Beating Bedbugs

Guidance on
Inspection &
Treatment



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Beating Bedbugs

Summary

1. Respond promptly to requests for treatments. Slow response allows time for bedbugs to spread further.
2. Thoroughly inspect the affected property and adjoining units also. Bedbugs can spread through buildings.
3. Use legal powers if necessary to ensure full access and treatment of buildings.
4. Make sure the property is fully prepared before treatment. If it is not prepared, don't treat.
5. Treat very thoroughly, within the label conditions.
6. Apply at least two residual treatments, approximately three weeks apart. The second treatment should use an insecticide from a different chemical class to the first treatment. Involve insect growth regulators and desiccant dusts, where appropriate.
7. Follow up to ensure eradication is complete.

Space for Local Authority logo & contact details

What is the Greater London Pest Liaison Group?

The Greater London Pest Liaison Group is a voluntary Group comprising members from within the Pest Control Departments of a number of Local Authorities from within Greater London. The objective of the Group is to maintain high standards of pest control and to disseminate sound technical information.

This document has been prepared by the Greater London Pest Liaison Group and is intended for use by professional pest control officers engaged in bedbug control work. Whilst it has been produced with great care, the publishers cannot accept any liability for inaccuracies or errors herein.

1. Legislation relevant to bedbug control

A number of Acts are relevant to bedbug control work. These are briefly summarised below. However this document is not an authoritative interpretation of the law and local authorities are advised to seek specific advice if considering using legal powers in support of bedbug control work.

1.1 Public Health Act 1936

This Act was introduced at a time when bedbugs were of great concern.

Section 90 (1) defines vermin as follows:

- Vermin in its application to insects and parasites, includes their eggs, larvae and pupae, and the expression verminous shall be construed accordingly.

Section 83 gives local authorities powers to:

- Serve notice for verminous premises, including the taking of *'such steps as necessary for destroying or removing vermin.'*
- Carry out works if not complied with, and recover reasonable costs
- Prosecute persons for not complying with a notice.

Section 287 covers powers to enter premises and allows any authorised officer to:

- Enter any premises at all reasonable hours. Admission cannot be demanded as of right to residential premises unless 24 hours notice of intended entry has been given.
- Ascertain whether circumstances exist which would authorise or require the council to take action or carry out any work under the Act, for the purpose of taking any action or carrying out any work under the Act.
- Apply to a JP for a warrant where admission has been refused, or refusal is apprehended, or premises are unoccupied, or case is urgent, or application would defeat the object of entry, and there is reasonable ground for entry into the premises for the stated purpose.

■ **The Public Health Act is currently the most appropriate and widely used legislation in support of bedbug control work in domestic premises.**

1.2 Environmental Protection Act 1990

Regarding bedbug control work, the Environmental Protection Act is considered to be of use only where bedbugs are spreading from one premises to another, not for an infestation in an individual premises.

- Section 79 states that *'Any premises in such a state as to be prejudicial to health or a nuisance'* may be considered a statutory nuisance.
- Under Section 80, where a local authority is satisfied that a statutory nuisance exists, or is likely to occur or recur, then it has the power to serve a notice (abatement notice). Failure to comply with requirements of notice is an offence (s.80(4)).
- Where an abatement notice has not been complied with, Section 81(3) gives the local authority powers to *'abate the nuisance and do whatever may be necessary in execution of the notice'*.
- Under Section 81(4) *'..any expenses reasonably incurred may be recovered'*. Section 81A (1) states that *'.. expenses recoverable from owner to be a charge on premises'*.
- Regarding powers of entry, Schedule 3 states that *'...authorised officer may enter at all reasonable times'* (schedule 3 (1)) *'..entry shall not be demanded of right without 24 hours notice of intended entry'* (schedule 3 (2)). *'Where entry is refused or refusal is apprehended or premises unoccupied or case is emergency or where application for admission would defeat object of entry local authority may apply to a Justice of Peace for warrant to enter'* (schedule 3 (3)).

In most bedbug cases, the Environmental Protection Act is considered to be less useful than the Public Health Act.

1.3 Housing Act 2004

This Act deals only with matters that are the responsibility of the owner/landlord. Action as outlined below cannot be taken against tenants.

The Housing Act lists a number of housing hazards, which may be categorised as Category 1 or 2.

Hazard 15 includes '*domestic hygiene, pests and refuse*', but this Hazard is very likely to be considered as Category 2 only.

Where a Category 2 Hazard occurs, the local authority may issue an Improvement Notice or Hazard Awareness Notice.

Section 239 states that premises may be entered at '*any reasonable time*', but there is no right of entry unless 24 hours notice is given to the owner and occupier. If unable to gain entry, a warrant may be obtained.

Of the Acts reviewed in this section, the Housing Act is considered to be the least useful in practice to those involved with bedbug control work.

2. Guidance on bedbug surveys

2.1 Objectives of survey

- Confirm that a complaint is actually due to bedbugs.
- To identify bedbug harbourage areas, to enable the treatment to be properly targeted.
- To determine whether other rooms/properties (e.g. those adjoining a known infested room or property) are also infested.
- Where an initial survey is carried out before the treatment visit, then this is an opportunity to explain room preparation requirements and provide a copy of the guidance sheet.

2.2 Survey tools and techniques

- Information from the resident may help in identifying harbourages.
- Careful inspection, using a torch, is the best technique. However a number of specific bedbug monitors are under development, and may offer advantages.
- Adhesive insect monitors as used for cockroaches etc are **not** effective for bedbugs.

2.3 Timing of survey

Initial inspections (and treatments) to be carried out as soon as possible after receiving the request.

2.4 Survey procedure within a room

Typical signs of infestation are:

- Bedbugs;
- Bedbug cast skins (*exuviae*);
- Bedbug faecal spotting;
- Bedbug eggs;
- Blood spots on linen.

Ask the resident where they have seen bedbugs. However some residents may be unaware they have bedbugs.

Potential areas for examination include:

- Mattress;
- Bed frame;
- Divan base and drawers;
- Valance;
- Headboard;

- Other furniture e.g. chests of drawers, wardrobe, chairs, sofas;
- Skirting board, base and top;
- Edge of fitted carpet;
- Floor-boards, if exposed;
- Corners of walls, and loose wall-paper;
- Behind pictures, posters;
- Shelves;
- Electrical sockets;
- Door and window frames;
- Curtain and pelmets;
- Personal items; books, toys, luggage, electrical items, etc.

Beware:

It can be difficult to distinguish the signs of an extinct infestation, from a current, active infestation.

Even with an experienced technician, light infestations are often overlooked, especially in congested rooms.

Solitary bedbugs will often occur away from the main clusters.

2.5 Surveying adjoining rooms and premises

- Bedbugs can easily move between rooms or adjoining properties. This is especially likely where direct connections exist along services etc. Infested flats etc. often occur in clusters as a result of local bedbug dispersion.
- In a multi-bedroom home, all bedrooms together with living rooms, should be inspected.
- In some properties the loft, and its contents, may need inspecting.
- In HMOs and blocks of flats, make arrangements to access and inspect nearby units. Use the GLPLG 'Bed Bug Awareness for Residents' leaflet as the basis for a letter drop to other residents. Of course do not identify known infested flats to other residents. Consider legal action (Section 1 above) if necessary

2.6 Record keeping

Records should be kept of:

- Address of surveyed premises and date.
- Name of resident.
- Rooms inspected and infestation status.
- Identify of insect problem.
- Housekeeping/room preparation status.



3. Guidance on bedbug treatments

3.1 Treatment timing

Treatments should start soon after receiving the initial request. However allow enough time for the householder to carry out the room preparation required (at least two days).

Undue delays in starting result in a more deeply entrenched infestation and also allow the infestation to spread.

3.2 Non-chemical treatments

A growing range of non-chemical treatments (heat, cold etc.) are becoming available.

None of them have any residual effect, so they are sometimes used in conjunction with insecticide treatments, rather than as stand-alone treatments. They are sometimes used to remove or kill bedbugs in sensitive parts of the room, particularly the mattress, and in premises with vulnerable residents.

They are all likely to be effective against insecticide resistant strains.

Current choices include:

- Vacuum cleaning will remove some exposed active stages, but will not remove eggs stuck tightly to the surface. Empty the bag or dust collection container into a waste container outside the premises.
- Solid carbon dioxide is effective on both eggs and active stages with which it comes into direct contact. However the treatment process is slow, and equipment is cumbersome to use in congested premises. Individual adult female bedbugs are often in isolated locations and may be missed.
- Steam treatment is effective on both eggs and active stages with which it comes into direct contact. Again the treatment process is slow and may miss isolated bedbugs.
- Heat 'bubble' treatments are effective against bedbugs on the items placed within the bubble, but the efficacy in the premises as a whole depends on the quality of the treatment used on the rest of the room.
- Heat treatments of the whole room are sometimes used. These may be effective

providing that there is no opportunity for bedbugs to retreat into deep voids and escape the heat and that the heat is maintained for long enough to penetrate internal voids.

At present, there are mixed experiences on the use and suitability of these treatments for regular use in domestic premises. As a result they are unlikely to be the main technique used for bedbug control. Views on the performance of these treatments may change however as UK experience grows.

3.3 Chemical treatments

3.3.1 Safe use of pesticides

Statutory conditions of use on insecticides must be read before using the products and followed in practice. A COSHH assessment should be carried out before treatment.

Key issues for resident safety are:

- Residents and pets must be excluded from treated rooms during treatment and until the spray deposit is dry. Spray is normally dry within two to three hours of application.
- Aquaria should be covered and the air-pump switched off during treatment and the drying period. The pump must be switched back on after ventilation of the room after treatment.
- Mattresses can be treated with certain insecticides (see Table 1), providing the mattress is subsequently covered with a sheet when used. If the resident is believed **not** to be using a sheet on the mattress, then non-chemical treatments of the mattress should be considered.
- Clothing must not be treated with insecticide. All clothing should be removed from drawers and wardrobes and tightly bagged to await laundry (See the GLPLG 'Preparing your home for bedbug treatments' leaflet). It should **NOT** just be carried loose into another room, as this will disperse the infestation.
- Food stuffs, utensils and food preparation surfaces must not be treated. They should be either removed or covered.

3.3.2 Insecticide formulations and products

Choice of insecticide formulations:

- Residual sprayable insecticide formulations are normally appropriate for most bedbug treatment.
- On porous surfaces such as wood and textiles, formulations such as suspension concentrates (SC), wettable powders (WP), and microencapsulated products (CS) typically give much better persistence than emulsifiable concentrates (EC), oil-based ready-to-use (RTU) and emulsion oil in water (EW).

- In addition, dusts (DP) also have a role for localised treatment of voids, e.g. behind skirting boards, behind headboards, in cable and plumbing conduits, behind electrical sockets, etc. However dusts will quickly lose effectiveness if wetted by spray.
- Space treatments (ULV and smoke generators) are unlikely to penetrate harbourages and will have very limited impact on bedbugs when used alone.

Pest control officers are strongly advised to check current insecticide approvals, as there are frequent changes.

Table 1: UK Professional Use Insecticides for Bedbug Control (April 09)

Insecticide class	Comments	Active substances and product(s)	Labelled for bedbugs	Labelled for mattresses
Carbamate	Resistance reported in UK	Bendiocarb, e.g. Ficam W and Ficam D	Yes	Yes (W)
Pyrethroid	Resistance reported in Denmark, UK and USA.	Pyrethrins	Yes	No
		Alphacypermethrin e.g. Fendona	Yes	Yes
		Phenothrin e.g. Digrain Bugs	Yes	Yes
		Deltamethrin e.g. K-Othrine	Yes	No
		Lambdacyhalothrin e.g. Demand	Yes	No
		Permethrin e.g. Perbio Choc, Permost	Yes	Yes
Insect growth regulator (IGR)	Limited data on field strains, but likely to be useful addition to conventional insecticides Slow acting, so normally used in mixtures	Flufenoxuron e.g. Tenopa (in mixture with alphacypermethrin)	Yes (as Tenopa)	No
		Pyriproxifen e.g. Cimetro (in mixture with alphacypermethrin) or NyLar used in tank mix with specified insecticides	Yes	No
Desiccant	Effective on resistant field strains Suitable for voids	Diatomaceous earth (DE), amorphous silica DE not being supported in EBD	Desiccants are exempt from COPR, so no statutory label precautions.	

Insecticide resistance

Recent work in the UK has shown that:

- There is widespread resistance to pyrethroid and carbamate insecticides.
- Insect growth regulators are believed to be useful against field strains, but are slow acting.
- Diatomaceous earth remains effective against field strains.

Nonetheless, the feedback from practical usage is that:

- With very careful and thorough insecticide application, especially of cracks, crevices and harbourage areas;
- And by using combinations (where approved) or sequences of insecticides from different classes;
- And by using a sequence of two or more treatments applied to the premises;

Then control and eradication can still be achieved (See 3.6 below)

3.4 Room Treatment

The room must be properly prepared before treatment (See the GLPLG '*Preparing your home for bedbug treatments*' good practice guide). If room preparation has not been carried out, then the treatment is very unlikely to be successful and should not be carried out.

Ask the resident where they have seen bedbugs.

Treatment should be very comprehensive, within the product label conditions. Typical treated areas include:

- Mattress: treat top, bottom, sides, handles, and any tears. See Table 1 for products approved for use on the mattress. The mattress is an area where non-chemical treatments may have a role (see Section 3.2 above).
- Bed frame (if present): Remove slats, if possible. Treat top, bottom and all crevices.
- Divan base (if present). Remove drawers. Remove fabric base to divan (with householder's permission.) Spray all external and internal surfaces of divan, including all joints and crevices. Spray external faces of drawers.
- Valance around base of bed. Treat very thoroughly; laundry may be more effective.
- Headboard. Treat all surfaces and crevices.
- Treat the carpet, especially edges against the wall or skirting board. Desiccant dust may be appropriate under the carpet.
- Treat the skirting board, including any gap between the skirting board and the wall and the base of the skirting board where it meets the floor boards or the fitted carpet.
- If the bed is normally pushed up against the wall, treat the walls with which the bed comes into contact.
- Treat corners of walls and any areas of loose wallpaper.
- Treat behind items fixed to the walls, e.g. pictures.
- If floor-boards are exposed, treat the joints in the floor boards. If there are exposed floor-boards in an infested bedroom, it is very likely that bedbugs will be harbouring under the

boards, and boards may need to be lifted to gain access for treatment.

- Curtain. Inspect and treat curtains, from the hems at the bottom end, to pelmets at the top (or launder).
- Chests of drawers. Remove drawers (bag contents for laundry). Treat all surfaces of frame. Treat external faces of drawers, but not interior where clothes come into contact.
- Wardrobe (bag contents for laundry). Spray interior and exterior surfaces of wardrobe thoroughly.
- Any service voids and electrical sockets etc should be carefully treated with desiccant dust.

3.5 After treatment

Before leaving the premises, draw the resident's attention to the GLPLG '*Preparing your home for bedbug treatments*' good practice guide. In particular:

- Remind customer not to enter treated rooms until spray is dry.
- Remind customer about laundry and cleaning requirements.
- Inform customer that occasional bedbug bites may continue for 2 weeks after treatment.

3.6 Treatment sequence

Multiple treatments are ***much more effective*** at eliminating bedbugs than a single treatment.

The minimum number of treatments to any infested premises should be two, although further treatments may be required if infestations persist.

Treatments should be spaced at two to three week intervals.

At present the most successful strategy appears to be use of a succession of different killing agents, together with insect growth regulator and desiccant dust where appropriate.

An appropriate pattern might be:

■ **1st treatment**

Carbamate, or pyrethroid, plus insect growth regulator. Dust voids with desiccant dust but do not wet the dust with spray, or it will lose effectiveness.

■ **2nd treatment**

(c. three weeks after first treatment)

Use an insecticide from a different class to that used initially, plus an insect growth regulator. Dust voids with desiccant dust.

■ **3rd treatment**

(c. six weeks after first visit)

Use an insecticide from a different class to that used previously, plus an insect growth regulator. Dust voids with desiccant dust.

However pest control officers are strongly advised to check current insecticide approvals, as there are regular changes.

3.7 Block treatment, or individual flats?

In many blocks, HMOs or hotels, bedbug infestations occur as clusters, extending through several adjoining or nearby flats or rooms.

The treatment pattern of the building should be based on the results of the survey, so:

- Identify infested flats through investigation of complaints, and proactive survey of adjoining and nearby properties (see Section 2 above). Of course do not identify known infested flats to other residents.
- Thoroughly treat all known infested properties. Adjoining flats may also be treated if charging is not an issue.

Full block treatments against bedbugs are highly labour intensive and disruptive. Nonetheless some blocks may be infested to the extent that a full block treatment is required.

3.8 Confirmation of eradication

Confirmation that bedbugs have actually been eradicated from the treated premises, is critical. A surviving and redeveloping infestation will disperse and infest other properties, undoing the work already carried out.

A surviving infestation can take several months to build up to a noticeable level again, so at three months after the last treatment:

- Phone the resident to determine the state of infestation.
- Or, visit and inspect the property.

Re-treat if infestation is still present.

3.9 Record keeping

Records should be kept of:

- Address of premises and resident's name.
- Status of infestation and rooms affected.
- Whether adjoining properties checked.
- Dates treated.
- Insecticide products used and quantities.
- Officer(s) carrying out treatments.
- Call-backs to treated properties.
- Other relevant issues.

Records should be in a format that enables easy retrieval and comparison with previous years.

Other publications in the GLPLG 'Good Practice' series;

- *Information for Residents;*
- *Information for Landlords & Property Managers;*
- *Information for Healthcare Professionals;*
- *Preparing your Home for Bedbug Treatment.*