



ASSOCIATION FOR THE
HEALTHCARE ENVIRONMENT

AHE Recommended Practice Series: Integrated Pest Management

This is the 2nd Edition of the first text in a series of publications currently in development and titled AHE Recommended Practice Series.

The Recommended Practices are specific topics critical to optimal health care environmental services performance.

Authors*:

Zia Siddiqi, Ph.D., B.C.E., Quality Systems Director, Orkin, LLC

Frank Meek, B.C.E., International Technical and Training Director, Orkin, LLC

Ron Harrison, Technical Director, Orkin, LLC

Austin M. Frishman, Ph.D., B.C.E., Founder, AMF Pest Management Services, Inc.

Fiona J. Nemetz, CHESP
AHE 2010 President

Patti Costello
Executive Director

This publication was developed in conjunction with Orkin Commercial Services.



COMMERCIAL SERVICES

© 2010 Association for the Healthcare Environment of the American Hospital Association,
155 N. Wacker Suite 400, Chicago, IL 60606.

* Select portions of this document were adapted from the June 2000 ASHES Professional Development Series publication on Integrated Pest Management (IPM). The authors wish to acknowledge Wayne L. Warren, author of the 2000 IPM document, for his valuable contribution.

Table of Contents

1 – Integrated Pest Management (IPM) Overview	1
2 – Establishing an IPM Program	4
2.1 Keys to Success	4
2.2 7 Key Components of an IPM Program	5
2.3 Non-Chemical Methods of Control	7
2.4 Chemical Methods of Control	10
2.5 IPM Program Documentation	13
2.6 IPM Training & Certification	14
2.7 Contracting With a Provider	14
3 – Quality Assurance	17
4 – Resources	18
4.1 Pesticide Toxicity	18
4.2 Pesticide Spills and Emergency Plans	18
4.3 Training and Information Sources	20
4.4 Glossary of Terms	21
4.5 Sample Sanitation Inspection Schedule	23
4.6 Sample IPM Information Sheet	24
5 – Bed Bug Control	25
5.1 Bed Bug Monitoring by Facility Staff	25
5.2 Non-Chemical Bed Bug Prevention	25
5.3 Non-Chemical Bed Bug Remediation	26
5.4 Chemical Bed Bug Remediation	27
5.5 Follow-up Inspection and Treatment	29
6 – Fly Control	30
6.1 Non-Chemical Prevention	30
6.2 Non-Chemical Remediation	32
6.3 Chemical Remediation	33

2.3 Non-Chemical Methods of Control

Recommended Practice:

IPM programs should aim to significantly reduce pesticide use by first using non-chemical strategies before using any chemical control measures to achieve the necessary level of control.

DEFINITIONS

HEPA filter High Efficiency Particulate Air filter, used to vacuum pests and their exoskeletons.

Pheromone Pest-specific sex hormone; used to attract or repel target pest.

2.3.1 As part of the regular inspections stipulated by an IPM program, staff should **identify any openings in the building exterior** due to settling that can be used by pests as harborage areas or entry points – no matter how small – and seal them with foam sealant or caulking. Examples of potential pest entry points include utility penetrations, window frames and vents.

RATIONALE 2.3.1 The best way to keep pests out of the facility is to physically stop them from entering wherever possible. Rats and mice can squeeze through openings as small as a quarter and a dime, respectively, while cockroaches need only 1/8 inch to enter. The smaller the pests, the smaller the opening needed.

2.3.2 Draft and implement a **written sanitation plan** indicating cleaning schedules, procedures and responsible parties *if such a plan does not already exist*. Conduct routine sanitation inspections of areas of high pest pressure (*see Sec. 4.5 for sample inspection schedule*).

RATIONALE 2.3.2 Vigilant sanitation is essential to effective pest management. Food and other debris found in unsanitary areas act as powerful pest attractants and favor pest survival.

2.3.3 Inspect all incoming supply shipments and delivery vehicles for signs of pest presence. Cockroaches can feed on the glue that holds cardboard containers together and often hide in the tunnels of corrugated cardboard. Bite marks or tiny holes in boxes or other packaging signal pest presence and call for immediate inspection of the surrounding areas. Remove all supplies from shipping containers before storing them. All suppliers and vendors should be aware that incoming product shipments are inspected as part of the IPM program and that cooperative pest management efforts are a requirement of the supplier relationship.

RATIONALE 2.3.3 Often pests enter a facility on incoming shipments.

2.3.4 Routinely inspect storage closets and plants in patient rooms for pests.

RATIONALE 2.3.4 Patients and visitors may inadvertently bring pests into the hospital from the outside on personal items such as clothing and overnight bags. Early detection and removal of these pests is critical to keeping pests out of facility without regular pesticide applications.

2.3.5 A variety of traps are available for the dual purpose of monitoring and control, summarized below. **Traps should be placed in areas most likely to be frequented by pests, but should be strategically located so as not to interfere with operations** – for example, loading and receiving areas, boiler rooms and other maintenance and employee areas.

All trap placements should be recorded on a detailed site map.

The site map should be updated each time traps are added, removed or relocated. Traps must be checked regularly, cleaned or replaced if necessary and all pest activity must be recorded for the purpose of monitoring pest populations and determining control options. Common traps and uses include:

- **Glue boards/sticky traps** of varying types are recommended to trap crawling insects and rodents.
- **Mechanical traps** can contain glue boards to restrict any biohazardous material can be used to monitor and control rodents. Only trained and authorized staff should dispose of rodents or rodent remains.
 - Rodents should be disposed of as humanely as possible. They should not be released as they may re-enter the building.
 - To dispose of rodent remains, make sure you are outside. Wear rubber, latex, vinyl or nitrile gloves. Do not touch the rodent – rather, let it fall out of the trap into a plastic bag. Then place the bagged rodent into a second plastic bag and seal it. Dispose of the remains by placing them in a covered trash receptacle outside that is regularly emptied. Contact the local or state health department for other appropriate disposal methods.⁹
 - If the trap will be reused, decontaminate it by immersing and washing it in a disinfectant or chlorine solution and then rinse thoroughly.
- **Pheromone traps and ultra-violet light traps** should be deployed as needed to monitor flying and stored-product insect pests.

RATIONALE 2.3.5 Mapping trap locations will aid in monitoring, understanding where the pest pressures are, and trap maintenance.

RATIONALE 2.3.5 Rodents are disease vectors and should be handled accordingly.

2.3.6 Vacuums equipped with HEPA filters are recommended to remove insects and any debris that might serve as an insect food source in clinical or other sensitive areas.

RATIONALE 2.3.6 HEPA filters leave behind less particulate matter than typical filters, reducing the chance of allergic reactions to such debris.

2.3.7 Modify landscaping as needed to support the IPM program, for example:

- Trim back vegetation and remove any mulch on the immediate exterior of the facility.
- Consult with landscapers to encourage landscaping plants that do not attract insects.
- Consider removing or relocating any decorative statues or stones near the building.
- Remove bird feeders and baths if birds become a problem. Also consider removing such items in response to rodent or mosquito problems.
- If contracting with a landscaping company, ask for a written landscaping plan and work with the contractor to ensure that the plan supports IPM program objectives.

RATIONALE 2.3.7 *Vegetation* touching building can allow crawling insects like ants to enter the building. *Mulch* provides harborage and sustenance for many pests that can work their way into a building, including rodents, carpenter and other species of ants, beetles and termites. *Stone decorative elements* trap moisture and provide numerous insects with a cool, damp hideaway. Pavement ants are also known to extend their colonies under such objects. *Bird feeders* also attract rodents, and the standing water found in birdbaths is an ideal mosquito breeding ground.

⁹Disposal recommendation of Centers for Disease Control and Prevention (CDC).

2.3.8 Conduct routine inspections of decorative plants and planters

on the facility interior. Work with the facility staff responsible for plant selection and care to ensure plants are replaced regularly and are watered appropriately. Enlist their help in monitoring and ask them to report any pest presence immediately.

RATIONALE 2.3.8 Plant decay (due to age or under- or over-watering) attracts insects, as does excess moisture found in over-watered plants.

2.3.9 Conduct routine inspections to **identify sources of unnecessary moisture** – leaky roofs, ice machines, refrigerators, pipes, broken sprinkler heads – and repair them wherever possible.

RATIONALE 2.3.9 Pests, like all living organisms, need moisture to survive. By diminishing the availability of moisture, pest pressure can be significantly reduced.

2.3.10 Work with facility management and Environmental Services staff to **quickly address all structural and waste management issues** identified by quarterly pest management audits (*see Sec. 3.1.1*), which may include the following common modifications:

RATIONALE 2.3.10 Quick attention to structural and waste management issues and other conditions conducive to pest infestations will help minimize pest pressure on the facility and reduce the need for pesticides.

- **All doors** should close tightly with no spaces around the edges. Door sweeps should be installed where necessary.
- **Trash receptacles** should be emptied and cleaned on a periodic basis. Outside dumpsters should be cleaned or rotated on a set schedule.
- **Exterior lighting** should be mounted away from a building, shining back toward the facility. Where lighting must be attached to building exteriors, sodium vapor lights should be used.
- Where possible, **roof ledges** should be made to pitch at a 45-degree angle to discourage birds from roosting.

- Even the smallest of openings can be a pest entry point as noted in section 2.3.1.
- Almost all common pests are attracted to piles of sitting garbage because of the smells given off by this material. Flies and rodents are often found in areas like garbage chutes and dumpsters. Staying sanitary and keeping odors in check in these areas will help in overall exclusion.
- Flying and crawling insects are attracted to exterior lighting. Placing it away from the building will attract them away from the building. Sodium vapor lights are much less attractive to flying insects.

2.3.11 Consider effects on pest populations during planning phases of new construction. Work with facility management to highlight and preventively address any impact that changes in facility design may have on the existing IPM plan and/or pest pressure in existing facilities and the surrounding environment. Consider consulting a pest management professional for additional advice prior to construction.

2.3.12 Be prepared to communicate the rationale for the IPM program to patients, visitors, clinical staff and other facility personnel who challenge the value of choosing non-chemical countermeasures over chemical ones (e.g., in the case of a pest sighting in a clinical area). (*See Sec. 4.6 Sample IPM Information Sheet*)