

INTEGRATED PEST MANAGEMENT IN HEALTH CARE FACILITIES

IMPLEMENTING AN IPM PROGRAM

Effectively Manage Pests | Identify Long-Term Solutions | Create Healthier Environments





PREFACE

Integrated Pest Management (IPM) is an environmentally friendly, commonsense approach to controlling pests both inside and on property grounds of a health care facility. Traditional pest control uses calendar-based pesticide treatments rather than non-chemical prevention, resulting in the routine application of pesticides. In contrast, IPM focuses on pest prevention and least-toxic control methods, making IPM a cost-effective, practical approach to pest management. Preventive pesticide application is limited to minimize the risk of pesticide exposure, especially when non-chemical methods provide the same results.

Health care facilities, including but not limited to hospitals, ambulatory centers, long-term care facilities, rehabilitation centers, and other outpatient facilities, must meet the highest level of sanitation, while caring for sensitive populations. While it is important that health care facilities be free from pests that pose health risks, it is also critical that patients and employees be protected from chemicals that may also threaten their health.

This toolkit was prepared to introduce and acquaint readers with effective IPM. It presents recommendations for best management practices for IPM in health care facilities. Throughout the nation, facilities that have adopted IPM report long-term, sustainable pest mitigation that reduces the use of pesticides.

Though EPA-registered pesticides include disinfectants and sterilants, this document does not address pathogen mitigation using EPA-registered products. The IPM principles discussed here can be applied to any urban pest management program and are not applicable just to health care environments.

To find out more about pest control and pesticide safety, visit: www.epa.gov/safepestcontrol.

Disclaimer

This toolkit represents the U.S. EPA recommendations for best practices for the successful implementation of pesticide safety and Integrated Pest Management in health care facilities, and **is not intended to supersede federal, state, tribal or local requirements, where those requirements are more specific or stringent.** Additionally, [The Joint Commission](#) has recommendations for health care facilities. You should modify the suggestions here to tailor them to your specific needs. Please confer with your federal, regional, state, tribal, and/or local regulatory authorities for current requirements in your area.





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This toolkit was primarily authored by:

- Jill Hardy, BSN, RN, Infection Preventionist, The University of Kansas Health System
- Mark K. Leshner, Entomologist, M.S., EPA Region 7
- Bethany Olson, IPM Coordinator, EPA Region 7

EPA Region 7 would like to thank the following individuals for their ideas and contributions:

- Marie Blankenship, EPA Region 7
- Amanda Cackler, The University of Kansas Health System
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HOW TO USE THIS TOOLKIT

If you have never developed an IPM program, you might not be sure where or how to start. This toolkit will provide guidance to help you develop, implement and evaluate an IPM program for your facility. You do not need to have training or certification to develop a program – anyone can be an advocate for safer pest management. However, pesticides should only be applied by federal, state or tribally certified pesticide applicators. Be sure to always follow pesticide label instructions, in addition to all relevant federal, state, tribal and local laws, regulations and ordinances. If anything in this toolkit conflicts with these policies, always adhere to local requirements.



Where do we start?

The first step is to review your current pest management practices. You can use the self-assessment on Page 6 to get started. This will help you identify potential areas for improvement, as well as potential obstacles, and provide you with baseline information necessary to develop a successful program for your facility. When you're ready to start establishing your IPM program, this toolkit will explain the steps to implementation.

Do we really need an IPM program at our facility?

It's likely that you are already performing pest management activities at your facility. Facilities using IPM report increased efficacy, long-term cost savings, reduced environmental impact, and fewer pesticide applications.

Will this toolkit tell us everything we need to do?

No. Because every facility is different, only you have access to all the information needed to develop and imple-

ment a successful program. The recommendations presented here can be adapted to your facility in order to create a program that works for you.

Is there anyone who can help us develop our program?

Yes. As you will see in the toolkit, the first step is to establish an implementation team. You might already have the skills and expertise you need to develop an IPM program, but you may also need help from outside experts. In some cases, you may need to train your in-house personnel or consult a professional pest management provider. You may reach out to state or local health officials for technical assistance. Additionally, many state governments and university extension programs have pesticide safety or IPM programs that may be able to offer technical assistance or training. You may also consult the EPA Center for IPM.





SELF ASSESSMENT

- Yes _____ No _____ 1. Do you have a policy and procedure on responding to pest introductions in your health care facility?
- Yes _____ No _____ 2. Do you meet with your pest management professional regularly to discuss pest management activities at your facility?
- Yes _____ No _____ 3. Are pesticide treatments used in and around your facility only as a last resort?
- Yes _____ No _____ 4. Do you routinely inspect and maintain areas that attract pests?
- Yes _____ No _____ 5. Do you have a written sanitation plan that includes routine inspections and cleaning of areas that attract pests?
- Yes _____ No _____ 6. Do you keep or have access to records of pest control activities in your facility, including records of pest inspections, pest-sighting logs, service reports of corrective actions, labels, and Safety Data Sheets (SDS) for any pesticide products applied?
- Yes _____ No _____ 7. Do you opt for reduced risk pesticide products, such as baits and gels, rather than liquid sprays?

If you answer NO to any of these questions, you may consider implementing an IPM program or reviewing your existing IPM program. The steps to implementing an IPM program are explained in this toolkit. If you answered YES to all these questions, you may already have an IPM program working for your facility but may consider some of the additional recommendations included.





GLOSSARY

Action threshold (action level): A point at which pest populations or environmental conditions indicate that pest control action must be taken.

Infestation: A reproducing population of pests. It can be a single mated adult female and may have eggs present.

Inspection: The systematic examination of a site for pest activity or conditions that might encourage or allow pests to become a problem.

Introduction: An individual pest or a group of pests that are not breeding, such as single or multiple immature pests or single or multiple male pests.

Monitoring: The regular, ongoing inspection of pest-vulnerable areas undertaken to provide accurate information to make appropriate decisions for managing pests.

Pest conducive conditions: Environmental conditions that attract pests by providing the pest with food, water and shelter.

Pest management professional (PMP): A contractual worker or staff member whose primary duties involve providing pest management services.

Pest management roles: The responsibilities assumed by individuals to maintain an environment free of interference from pest and pesticide risks.

Pesticide: Any substance or mixture of substances intended for preventing, destroying, repelling or mitigating any insect, rodent, nematode, fungus, weed, or any other form of pest.

Pesticide label: All printed material attached to or part of the pesticide container, including directions for use, and storage and disposal instructions. Users are legally required to follow directions on pesticide labels.

Pesticide resistance: Natural or genetic qualities of a pest population that enable pests to tolerate the poisonous effects of certain types of pesticides that are toxic to other members of that species.

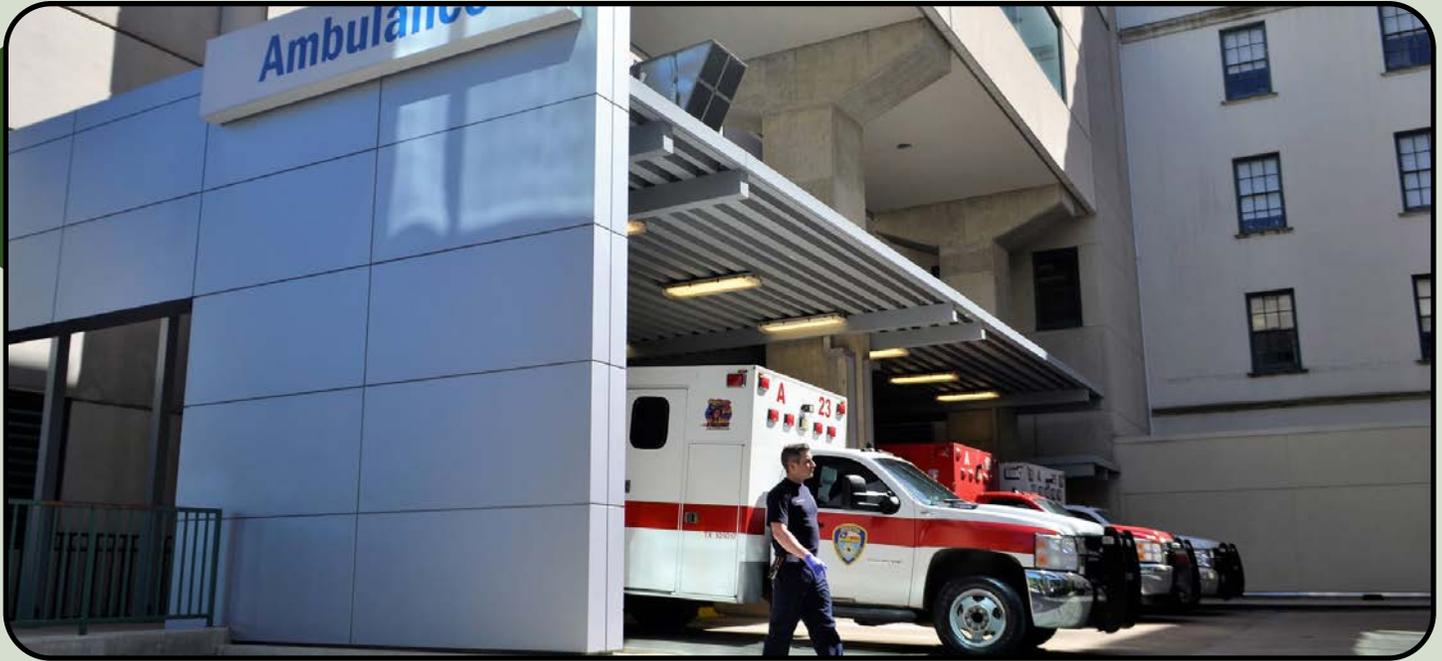
Risk (as it refers to pesticides): The likelihood of experiencing some health effect as a result of using a product. The risk of any pesticide use depends on which pesticide is used, how much pesticide is applied, how often the pesticide is applied, and who or what has contact with the pesticide.

Signal Word: Word found on pesticide product labels that describes the acute (short-term) toxicity of the formulated pesticide product. Signal words include: DANGER, WARNING or CAUTION. Products with the DANGER signal word are the most acutely toxic. Products with the signal word CAUTION are the least acutely toxic.





INTRODUCTION



Pests can carry diseases, create unsafe conditions, and cause stress to patients and staff. It's no wonder that when faced with pest introductions, or the prospect of future infestations, we want a fast and simple solution – a silver bullet. As a result, we often depend heavily on chemicals to treat the symptom of our pest issues, rather than resolving the underlying problem that led to the pest presence. The result of this short-sighted approach is that pests are often not managed safely, effectively or economically.

In contrast, IPM is a science-based decision-making process that emphasizes prevention, knowledge of pest biology, the use of least-disruptive control tactics, and the judicious use of pesticides. Through IPM, we address the reasons why we have pests in the first place and take steps to prevent future pest incidents. Once established, this program can easily be incorporated into any existing environmental and coordinated health program with committee oversight and reporting requirements.

Pests need food, water and shelter to survive, and the goal of IPM is to deny them these necessities. IPM does this by instituting a combination of commonsense practices that prevent pests from infesting buildings and grounds by both limiting access and reducing their attractiveness. IPM is not a single pest control approach, but rather a strategy of combined approaches that synergize to limit a pest's ability to survive and thrive.





The best way to manage pests is to create an inhospitable environment by denying them access to food, water and shelter. Repairing water leaks; sealing around pipe and electrical entries into buildings; closing doors; cleaning food service areas daily; trimming trees that touch buildings; installing lids on waste receptacles; moving dumpsters away from buildings; removing excess equipment and clutter; selecting pest-resistant construction materials; and other simple approaches limit a pest's ability to establish a foothold in and around facilities. Not only do these methods control pests, they also add to the aesthetics of the human environment, conserve energy, and improve air quality. When pests are found through active monitoring, IPM encourages low-risk control methods that include manual, mechanical and cultural tactics in addition to the judicious use of pesticides.



Note that IPM does not exclude the use of pesticides, but rather encourages the use of multiple mitigation approaches – and when deemed necessary, the application of pesticides that pose the least risk to people and the environment. IPM focuses on long-term solutions to pest issues rather than routine and repetitive use of pesticides.

The term “integrated” in Integrated Pest Management also means that the strategies of a successful program are integrated into the daily routines of various health care management activities, including custodial services, facilities management, cafeteria services, grounds and landscaping, environmental health and safety, and new construction. To ensure everyone contributes to program success, they should be empowered with knowledge of its components and how their individual activities impact the program.





ESTABLISHING AN IPM PROGRAM IN YOUR FACILITY



Developing a sustainable IPM program is a multi-step, continuous process. The key steps, listed here, are explained in more detail throughout the toolkit with the associated step number appearing on the page where the specific step is discussed.

1. Establish Your IPM Team
2. Develop an Official IPM Policy and Procedures
3. Set Pest Management Roles for Everyone
4. Inspect, Identify, Monitor, Evaluate
5. Implement Pest Prevention Strategies
6. Document and Communicate Pest Management Activities

Program Review

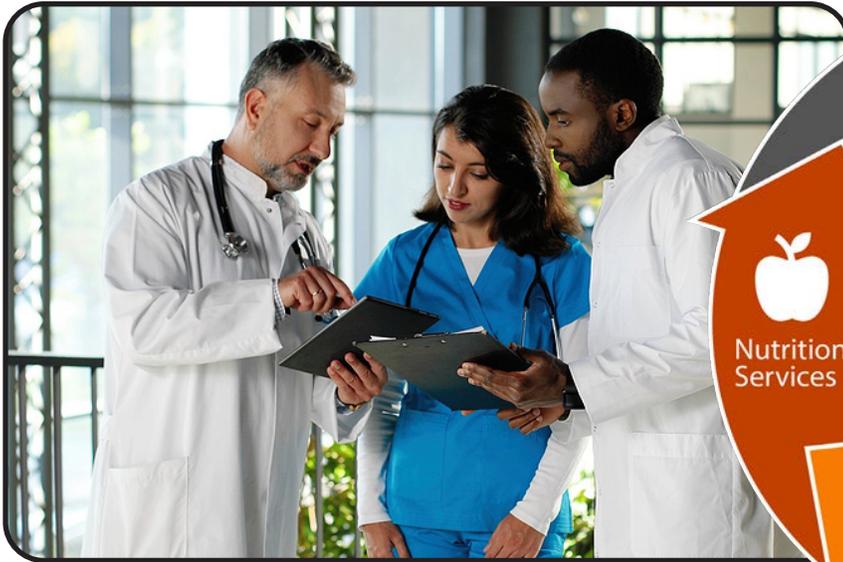
Your IPM program should be reviewed annually to ensure program objectives are being met. If you have a pest management contract, you should involve your pest control company in the annual review. Some elements to review:

- IPM policy and procedures
- Pest incident trends (i.e., frequency, location, time of year, etc.)
- Pesticide application records
- Pesticide product labels and Safety Data Sheets (SDS)
- Budget and spending
- Need for staff training or education
- Pest management contract, if applicable





1 ESTABLISH YOUR IPM TEAM



Examples of helpful skills are:

- Knowledge of accreditation standards and licensing requirements
- Ability to oversee the program
- Ability to influence pest management decisions
- Ability to monitor and document pest issues
- Ability to address building maintenance issues
- Ability to identify pests and control methods
- Ability to advise on health implications of pests and pest management decisions
- Ability to communicate regularly about the program
- Ability to review operating budget and contracts

Consider who among your employees, partners, and outside experts can provide these skills so you can develop the most effective IPM program possible. Those who might be part of your team include:

- Environmental Services
- Environmental Health
- Facilities Management
- Infection Prevention and Control (details at right)
- Nutrition Services
- Laundry Services
- Building Owner

Infection Prevention and Control (IPAC):

It's important for an infection preventionist to understand ectoparasite (e.g., scabies, lice) transmission with infested persons or fomites (objects or materials that are likely to carry infection, such as clothes, utensils, and/or furniture). Many parasitic insects (e.g., bed bugs) require standard precautions and do not require consultation from an infection preventionist, but rather a health care procedure empowering staff on how to handle parasite introductions.





2

DEVELOP AN OFFICIAL IPM POLICY AND PROCEDURES

EPA recommends that all facilities consider implementing a policy addressing the safest possible use of pesticides and the implementation of a coordinated IPM program. By publishing a policy, the facility leadership establishes a commitment to sustainable pest management practices and the use of reduced-risk methods. You will want to start by looking at policies and procedures currently in place:

- What is our policy on pest management in facility buildings?
- Who performs pest management activities?
- What types of activities are being done?
- Are pesticides being sprayed only when and where they are most needed?
- Do current policies reflect our commitment to creating healthy environments?

You may need to update or create policies to support the goals and objectives of your IPM program. The IPM policy should detail the health care facility leadership's commitment to IPM. In addition to an IPM policy, IPM procedures provide action steps to be followed, depending on the specific pest present.

Some information you may want to include in your policy and procedures:

- Details on monitoring and inspections
- Action thresholds
- Who can request pest control measures, including sanitation of a pest-conducive condition, pest-proofing, or pesticide application?
- Who can apply pesticides?
- How pest sightings should be reported and managed?
- Who should be educated about the IPM program?
- How patients and staff should be notified prior to a pesticide application?



The policy and procedures should be written down and posted for all staff members. Staff should be aware of the IPM policy and procedures and know where to go for further information or questions.

In addition to structural pests, there are also common ectoparasites that often affect the health care setting. Individual procedures are needed to ensure staff have a consistent response to the environmental control of these types of pests. Common ectoparasites may include:

- Bed bugs
- Mosquitoes
- Fleas
- Ticks
- Lice
- Scabies
- Myiasis

See Appendix A for an example IPM policy. See Appendix B for an example IPM procedure.

A model IPM policy can be found at: www.epa.gov/managing-pests-schools/ipm-schools-model-pesticide-safety-and-ipm-guidance-policy-school-districts.





WORKING WITH A PEST CONTROL COMPANY

Many facilities may contract out pest control services. If you have a pest control contract, you will also need to review the contract specifications to ensure it is consistent with your IPM policy. When working with a pest control company, it is important to have a well-written contract to reduce confusion and ensure you are getting the best quality of service.

Before choosing a pest control company, administrators can inquire with the local Better Business Bureau and their state pesticide regulatory authority to learn if there have been any complaints or violations against a prospective firm. The selection of a pest control company should not be based solely or primarily on the lowest bid. The quality of the expected service is extremely important. If pesticides are misused, both health and property can be damaged.

Some pest control companies offer service contracts in which structures are routinely treated for a particular pest. These types of service contracts may be necessary in some situations, such as warehouses that receive crates often infested with cockroaches. Often, routine pesticide applications are not necessary unless there is a constant infestation by a pest and non-chemical methods have failed to control the pest. Service contracts should include periodic inspections, but pesticides should not be applied unless the pests are actually present and cannot be controlled by other means.

Some suggestions for IPM bid specifications:

Include a list of all facilities and properties to be covered by the contract, as well as a map showing their locations. This is important for the bidder to estimate travel and response times for routine and emergency services.

Require all bidders to include photocopies of:

- A valid state, tribal, or federal structural pest control license or certificate, depending on the state or tribe, issued to the individual who applies pesticides or who has been authorized to apply pesticides by successfully completing a state, tribal, or federal pesticide applicator training program;
- A current insurance policy covering pest control activities; and

- The certification card of any pest control supervisors (if different from the license/ certificate holder).

On-site inspections: Before submitting their bids, prospective bidders should conduct a walk-through of every site to be included in the contract. Potential bidders should view the facilities and pest problems firsthand so they can make a realistic estimate of the services needed and the time required to provide them.

Minimum service times: The minimum amount of time that a pest control technician should take per scheduled visit can be defined in the bid. Bidders should understand that minimum service times are an expectation of the contract.

The contractor should regularly use appropriate inspection and monitoring tools and procedures to find pest infestations and determine the need for corrective action.



Additional suggestions for IPM bid specifications and contracts related to pesticide use:

- Pesticide use should be targeted and applied on an as-needed basis only. In general, routine (e.g., monthly) applications of pesticides are not a component of an IPM program.
- Reduced-risk formulations and methods (e.g., baits, bait stations, and crack-and-crevice or void treatments)

are preferred over aerosol, broadcast, and baseboard treatments.

- Aerosol or machine-generated fogs, mists, or space sprays should not be used except in extraordinary situations.

Additional IPM bid and contract guidance can be found at:

www.epa.gov/sites/production/files/2016-08/documents/school_ipm_bid.pdf





3

SET PEST MANAGEMENT ROLES FOR EVERYONE



The pest management professional is not the only person responsible for pest control. Everyone has a role in managing pests, since everyone who frequents a building contributes to the conditions that attract and sustain pests. By working together as a team, employees and management can create a healthy, pest-free environment in and around your facility. The more team members “buy in” to their individual roles, the better the pest management system will work. The functions and responsibilities for various groups are identified below and should be outlined in the health care facilities’ IPM policy.

1) Oversight and Management – The IPM team may encourage the adoption of the new pest management approach by making an open commitment to IPM and educating others about the IPM program in and around the facility they represent. The team ensures all staff have access to the developed IPM policy and procedures. The team may also communicate with hospital leadership to make resources available to the program based on their stated goals and objectives for pest management.

2) IPM Team Leader/Coordinator – Consider appointing one person to coordinate your IPM program and provide oversight of the day-to-day pest management activities. The role could be filled by a facilities manager or delegated to a staff person. The team leader should be familiar with the principles of IPM, pesticide safety, pest control contract oversight, recordkeeping, and pesticide regulations. EPA recommends annual training for the IPM team leader, which may be available from your state pesticides program, university extension, or other agencies. The IPM team leader is the key point of contact for pest control services and is informed of any pesticide applications to ensure they are in line with the

facility’s IPM policy. The team leader is also the advisor to the committee charged with program oversight and serves as the primary educator of staff on their responsibilities in IPM procedures. Responsibilities could vary depending on state regulations and statutes.

3) Staff, Patients and Visitors – Certified pesticide applicators and IPM team leaders have extensive and direct responsibilities related to pest management, but everyone can have positive or negative impacts on pest management in their daily activities and duties. A successful IPM program requires good communication. IPM procedures may serve as guidance documents to engage other departments, staff and teachers in their roles in pest problems and help facilitate communication. Include a procedure for staff to report pest sightings and pest-conducive conditions to the IPM team leader. Communicate IPM procedures with staff and assure them that their pest concerns are being addressed.

In some cases, patients and their visitors may also contribute to pest problems in your facility. Having good communication between the IPM team leader, nursing staff, and patients will help mitigate pest introductions from patients and their visitors.

4) Education and Training – An IPM program should include a commitment to educating staff, food workers, custodians, maintenance workers, grounds and landscape staff, administrative personnel, and management on IPM procedures. Everyone should be informed on how to refer to IPM procedures and to report pests and pest-conducive conditions. Additionally, it is very helpful for staff and management to understand how their own behavior can help to alleviate or contribute to pest problems. Reducing clutter, storing food items in airtight containers, and practicing good sanitation are examples of actions anyone can do to have a positive impact on pest management. Staff should not bring pesticides from home to use in or around the facility. All pesticide products, including those purchased at a retail store, should be applied only by a designated pest management specialist according to label directions.





4 INSPECT, IDENTIFY, MONITOR, & EVALUATE



An IPM program consists of a cycle of inspecting, identifying, monitoring, selecting an appropriate method of control, and evaluating the results. Routine inspection and accurate identification of pests are vital steps in IPM to ensure that control methods will be effective. Monitoring includes inspecting vulnerable areas for pest evidence—such as entry points, food, water, and places where pests live—along with estimating pest population levels. Once the pest has been identified and the source of its activity is pinpointed, habitat modifications may greatly reduce the pest’s prevalence. The most common and effective habitat modifications are exclusion, repair and sanitation. If preventive methods are no longer effective or available, IPM programs then select a proper control method, based on both effectiveness and risk. Evaluate how well control measures worked to ensure the continuing success of the IPM program.

5 IMPLEMENT PEST PREVENTION STRATEGIES

Prevention strategies may include sanitation and clutter management, redesigning and repairing structures, and establishing watering and mowing practices for green spaces. Pest prevention strategies can be incorporated into both new construction design and preexisting structures. Such preventive measures reduce the need for routine pesticide applications. IPM strategies for specific health care sites are provided below.

IPM Strategies for Indoor Sites

Typical pests: Mice, rats, bats, bed bugs, bat bugs, cockroaches, ants, filth flies, wasps, hornets, yellowjackets, spiders, termites, carpenter ants, and other wood-destrating insects.





Entryways:

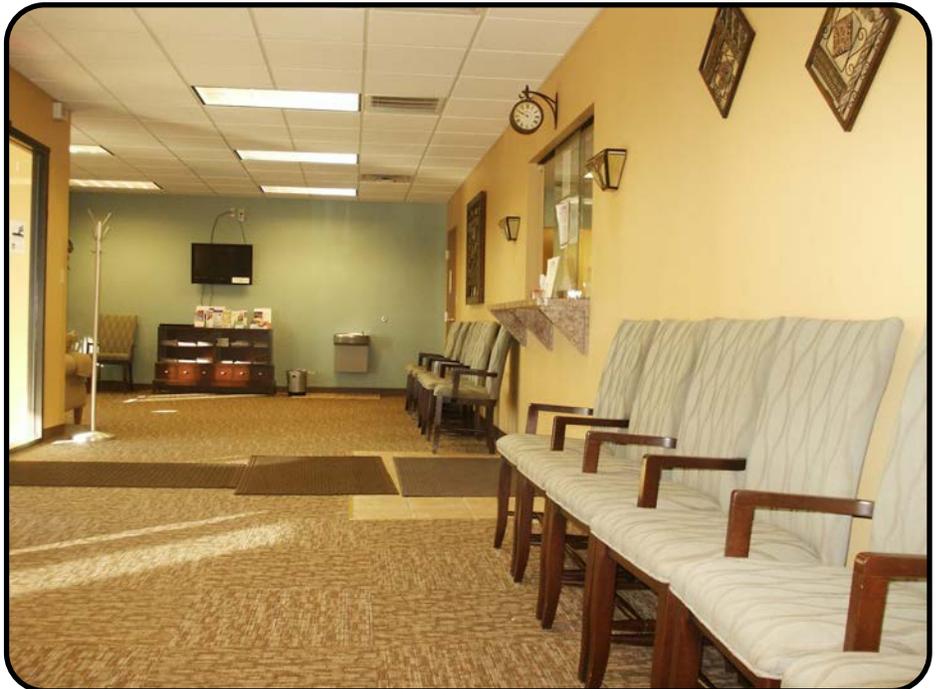
Gaps around doorways and windows, open windows and doors, holes and cracks in exterior walls and floors, openings around pipes and electrical chases, or HVAC ducts:

- Keep doors and windows shut when not in use.
- Place weather stripping, door and bottom sweeps on exterior doors.
- Seal gaps around windows and place weather stripping where missing.
- Seal openings in walls and floors with pest-resistant and structurally sound materials.
- Install or repair screens in doors, windows, and other exterior openings.
- Install air curtains above exterior doors near cafeterias and food storage areas.
- Keep vegetation, shrubs, and wood mulch at least 12 inches away from structures.
- Trim tree branches to at least 6 feet away from building exteriors and roof lines.
- Use low UV-emitting light bulbs for security lighting on buildings to avoid attracting pests, or mount security lighting away from doors so that it shines on the entrance but attracts pests away from it.

Office Space and Waiting Rooms:

Includes laboratories, non-clinical areas, administrative offices, and hallways:

- If food and beverages are allowed, ensure that areas are cleaned and waste removed daily. Any stored food should be kept in sealable containers.
- If indoor plants are desired, keep them healthy; do not overwater or keep plants in standing water. When small insect infestations appear, remove the plants from the facility until infestation is mitigated.
- Keep areas dry by removing standing water and water-damaged or wet materials.
- Dust and vacuum regularly and remove clutter and debris.
- Routinely clean desks, cabinets, and storage closets.
- Encourage patients with apparent pest infestations (head lice, scabies, bed bugs, etc.) to report for evaluation and consultation.
 - If applicable, provide sealable plastic bags or storage containers for storage of coats, jackets, caps, clothing, and other non-essential personal items.
 - Educate patients to bring only essential items to current and future appointments.
 - Remember to treat patients with dignity and respect. Pest infestations can cause unnecessary stress.





Clinical Care Setting:

Patient hospital room, exam rooms, dialysis center, hospice home, long-term care facility:

CRITICAL NOTE: *It is not necessary to cancel or delay scheduled appointments, procedures, surgeries or exams for patients who report experiencing a pest control problem.*

- Follow developed procedure outlining how to respond to pest control concerns and patient infestations that all staff follow.
 - The procedure should outline the following:
 - Standard precautions
 - Maintain an uncluttered environment
 - Remain vigilant assessing the environment
 - Limit personal items: place non-essentials items in a patient's belongings bag
- Clean and maintain drains (including floor drains) to prevent standing water and the buildup of organic matter that can attract pests.
- Maintain sinks, toilets and showers to avoid excessive moisture or standing water. Even small leaks can support a pest infestation.
- If food and beverages are allowed, ensure that areas are cleaned and waste removed daily. Pay special attention to food residue in furniture or hard-to-reach areas. Any stored food should be kept in sealable containers.



Food Preparation and Serving Areas:

Cafeteria dining room, nutrition rooms, main kitchen, employee lounge, vending machines, and food storage rooms/pantry:

- Sanitation is the first and most important step in controlling pests. Enforce stringent sanitation standards to reduce the availability of food and water for pests – remove food debris, sweep up all crumbs, fix dripping faucets and leaks, and dry out wet areas. Promptly clean food preparation equipment after use, and routinely remove grease accumulation from vents, ovens and stoves.
- Store food in tightly sealed containers that are inaccessible to pests. Containers must have tight lids and be made of plastic, glass or metal. Foods prepared for service and leftovers should be covered and stored in appropriate refrigeration/warming containers.



- Place all waste in plastic bag-lined trash cans. Remove waste and place in dumpsters between services. Trash cans that are expected to hold waste for a significant portion of the day should be covered with lids. All trash cans should have all waste removed at the end of each day.
- Remove bulk products from cardboard boxes, and place cardboard in appropriate recycling receptacles, if applicable. Never store excess cardboard indoors. Cardboard is easily accessible to pests and is an inappropriate storage material.
- Place screens on vents, windows, and floor drains to prevent cockroaches and other pests from using unscreened ducts or vents as pathways. Floor drains should be cleaned weekly to remove grease and accumulated food waste that could act as an attractant for flies and other pests.





- Install air curtains (as appropriate) above exterior doors near cafeterias and food storage areas.
- Rodents are a common problem for food service areas, but rodenticides pose a significant cross-contamination health risk to food. In food service and storage areas, capture rodents using mechanical or glue traps. (Note: Place traps in areas inaccessible to children. Mechanical traps, including glue boards, used in rodent control must be checked daily. Dispose of killed or trapped rodents within 24 hours.)

Areas with Plumbing:

Bathrooms, rooms with sinks, dishwashing rooms, laboratories, aquatic therapy pools, and maintenance areas:

- Promptly repair leaks and correct other plumbing problems to deny pests access to water. Even small leaks can support significant pest infestations.
- Routinely clean floor drains, strainers and grates.
- Seal pipe chases with pest-inhibiting material (i.e., steel wool vs. caulking), properly fitting escutcheons.
- Keep areas dry. Avoid conditions that allow the formation of condensation.
- Increase ventilation in humid rooms. Areas that never dry out are conducive to pest infestations and promote mold and fungi growth.
- Store paper products away from moist areas and direct contact with the floor or walls. Remove bulk products from cardboard boxes and place excess cardboard in appropriate recycling receptacles.

Maintenance Areas:

Boiler room, mechanical room, custodial-janitorial areas, and pipe chases:

- Keep all areas free of clutter. Remove excess equipment, construction materials, and waste promptly.
- In rooms with service sinks, promptly clean mops and mop buckets after each use; dry mop buckets and hang mops vertically on racks above floor drains.
- Install ventilation to reduce humidity and promote drying of items that frequently become wet.
- Install screens on ventilation to limit pest entry.
- Store and consume food in designated areas only.
- Place secure lids on trash cans and install plastic liners. Clean trash cans regularly.



IPM Strategies for Outdoor Sites

Typical pests: Structural and public health pests, such as filth flies, stinging insects, mice, rats, birds, and wild animals.

Recycling, Solid Waste, and Raw Waste Collection Areas:





- Dumpsters, cooking oil waste containers, and other waste receptacles can be appropriately designed for intended use and made of durable, pest-resistant materials. Receptacles should be equipped with access lids that can be completely resealed.
- Recycling containers should be exclusively dedicated for such use and be designed to protect contents from the weather and pest infestation.
- All waste containers should be cleaned on a regular and scheduled basis. Both interior and exterior of dumpsters should be pressure-washed with appropriate cleaners to remove spillage and accumulated waste.
- All bulk waste receptacles should be placed at least 50 feet away from exterior doors and ideally away from the building itself.
- All waste receptacles should be placed on cleanable, hard surfaces. Waste areas should be cleaned on a routine basis to remove spillage and accumulated waste.
- All waste receptacles should be serviced at a frequency that does not allow contents to overflow or be placed on the ground. Outdoor trash cans should be serviced daily, with no waste allowed to stay overnight.

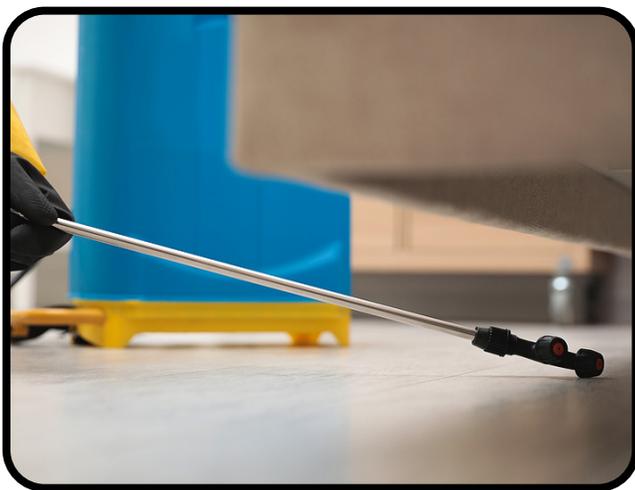


Parking Lots and Common Areas:

- Limit standing water by designing grounds and parking lots to adequately drain water away from buildings and property.
- Place appropriately designed trash cans/waste receptacles in high-traffic areas to limit garbage from being discarded onto the ground. Service receptacles daily as discussed above.

Lawns and Landscape Areas:

- Frequently maintain vegetation, shrubs, and wood mulch to keep them at least 12 inches away from structures.
- Trim tree branches to at least 6 feet away from building exteriors and roof lines.



- Frequently inspect and maintain water features, such as fountains, ponds or bird baths, to prevent mosquito breeding and larva development. Increase water circulation or change water frequently to prevent stagnant

Applying Pesticides

IPM programs take advantage of all appropriate pest management strategies, including the judicious use of registered pesticides as appropriate. Pests that pose significant risk to human health and safety, structural integrity, or economic loss should be controlled immediately. This often requires the use of pesticides to quickly reduce pest populations, in addition to IPM measures as a long-term solution.





Since children, elderly, pregnant women, and immunocompromised individuals are at the greatest risk of injury or negative health impact from a pesticide exposure, EPA recommends a managed approach where pesticides are only used when and where pests are present or expected to be present as determined by monitoring. The use of pesticides should be approved by the IPM team leader and only applied by state or tribally certified pesticide applicators that are knowledgeable in IPM. Staff should be notified 24 to 48 hours in advance of all pesticide applications, except in emergencies. Treated areas should be marked with highly visible signs. Pesticides should not be applied when patients or other people are present or expected to be present, per the pesticide's labeled re-entry requirements or for at least eight hours after application, whichever is greater.

The following general recommendations should minimize exposure to people and other non-target species when applying pesticides:

- Read and follow all label instructions. The label is the law.
- Choose a pesticide that is labeled for the specific site and pest you are trying to control.
- Use a spot-treatment method of application to treat only the infested areas.
- Limit the use of liquid sprays, foggers, or volatile formulations to minimize human exposure. Instead, use bait, paste or gel formulations and crack-and-crevice treatments when possible.
- Read the signal word on the pesticide label to select the least toxic products of those that are sufficiently effective.
- Place all rodenticides into tamper-resistant bait boxes in locations not accessible to patients or staff.
- Apply pesticides only when occupants are not present or in areas where they will not be exposed to the material applied. Note any re-entry time limits listed on the pesticide label and be aware that some residues can remain long after application.
- Use proper protective clothing and equipment when applying pesticides.
- Properly ventilate areas after pesticide application, according to label directions.
- Notify staff of pending pesticide applications. Pay special attention to individuals with increased vulnerability to pest and pesticide exposure (asthma, etc.).
- Keep copies of pesticide labels, consumer information sheets, and Safety Data Sheets (SDS) in easily accessible locations (IPM team leader's office, facilities manager's office, etc.).





Storing Pesticides:

Be sure to check the pesticide label for storage and disposal instructions. Store pesticides off-site or in buildings that are locked and inaccessible to unauthorized personnel. Be sure adequate ventilation is provided to the pesticide storage area. Segregate and store herbicides, insecticides, rodenticides and baits separately to avoid chemical reactivity and to limit pest avoidance of baits that absorb chemical smells. Avoid storing pesticides in places where flooding is possible or in open places where they might spill or leak into the environment. Store flammable liquids away from an ignition source. Check for state recommendations and requirements for pesticide storage.

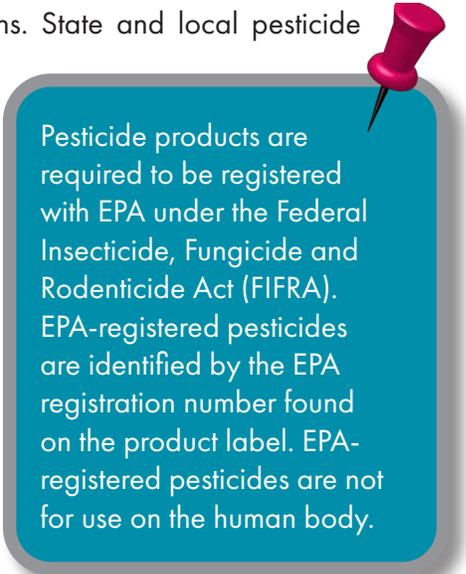
If pesticides are stored in occupied buildings, take special care to ensure that the air in the occupied spaces does not get contaminated. Place a notice outside the designated storage area. Store all pesticides in their original containers and secure lids tightly. Make sure that childproof caps are properly fastened. Store pesticides only in spaces that are physically separated and closed off from occupied spaces and with adequate exhaust ventilation (i.e., the air is vented directly to the outside). Ensure that the air in the pesticide storage area does not mix with the air in a centralized ventilation system.

Dispose of unwanted pesticides properly according to label instructions. State and local pesticide disposal laws may be stricter than the federal requirements on the label. Check with your state or local agencies before disposing of unwanted pesticides.

Posting and Notification:

Some states and localities require facilities to notify staff of impending pesticide applications. Even in the absence of specific laws, health care facility leadership should consider adopting the practice of informing staff of upcoming pesticide treatments. If notification and posting is a new practice at the health care facility, the new policy should be explained so that it will not be misinterpreted that more pesticides are being applied than previously. When good IPM practices are followed, concerns raised by notification and posting activities should be minimized.

Notification can be accomplished by posting notices around the facility, sending notices to staff through email and/or text alerts, or posting them to the website in advance of pesticide applications. Health care facilities should consider posting notices in areas that will be or have been treated. The IPM team leader and pesticide applicator should be prepared and available to provide more specific information when questions arise.



Pesticide products are required to be registered with EPA under the Federal Insecticide, Fungicide and Rodenticide Act (FIFRA). EPA-registered pesticides are identified by the EPA registration number found on the product label. EPA-registered pesticides are not for use on the human body.





6

DOCUMENT AND COMMUNICATE PEST MANAGEMENT ACTIVITIES

Recordkeeping is critical to determining the efficacy of any IPM program. Well-maintained and accurate records provide a means to verify that the policy is being followed, identify historical trends and repetitive issues, and justify decisions and actions taken to mitigate pests.

Recordkeeping allows the facility to evaluate the results of practicing IPM to determine if pest management objectives have been met. Keeping accurate records also leads to better decision-making and more efficient procurement of pest control materials (monitors, traps, pesticides, etc.). Accurate records of inspecting, identifying and monitoring activities document changes in the site environment (reduced availability of food, water or shelter); physical changes (exclusion and repairs); pest population changes (increased or reduced numbers, older or younger pests); or changes in the amount of damage or loss.

A complete and accurate pest management log should be maintained for each property and kept in the office of the IPM team leader or facility manager. Pesticide use records should also be maintained to meet any requirements of the state regulatory agency or applicable local oversight entity. The logbook should contain the following items:

- A copy of the IPM policy and procedures.
- Pesticide use and service schedules for each property/site.
- A copy of the current EPA-registered label and the current Safety Data Sheet (SDS) for each pesticide used on the property.
- Pest surveillance data sheets to record, in a systematic fashion, the type and number of pests or other indicators of pest population levels revealed by the monitoring program for the site. Examples include date, number, location, and any new pest infestations observed or removed, as well as date, number, and location of pest signs observed.
- Diagrams of pest-vulnerable areas that note historical pest activity, including the locations of all traps, trapping devices, and bait stations in or around the site.
- Listings and diagrams of environmentally and/or culturally sensitive areas where pesticide use must be avoided or extremely limited.
- Copies of all pest management contracts.



If you have a pest control contract, you may need to coordinate with your pest management company to receive and review records. Records should be reviewed as part of the annual IPM program review.





EVALUATING THE COSTS

Results from IPM programs across the nation indicate that long-term costs of IPM are less than conventional, calendar-based pest control programs that rely solely on the use of pesticides. Whether an IPM program raises or lowers costs depends mostly on the nature of current custodial, maintenance, cafeteria, grounds, and pest management operations. To fit an IPM program into the existing budgetary framework, administrators should consider what additional and redistributed expenditures are involved. As with any program, insufficient resources could jeopardize the success of IPM.

Potential Offset Costs

Initiating an IPM program may require repair and maintenance activities to prevent pest entry and eliminate sources of shelter, food and moisture. Examples of these one-time expenses that may result in future budgetary savings include:

- Improving waste management by moving trash or garbage containers away from buildings to reduce the opportunity for pest invasion. This will result in fewer pest problems and reduce the need for other pest control procedures.
- Installing physical barriers, such as air curtains over outside entrances to kitchens, which results in reduced flying insect problems and savings in years to come.
- Focusing on preventative maintenance and repairs to correct such situations as leaky pipes. This effort reduces future maintenance problems, reduces utility costs (electric and water), and prevents pest problems.
- Training on pesticide safety and IPM. When everyone understands and does their part, the need for comprehensive pest management is significantly reduced.
- Adjusting the landscaping adjacent to buildings to discourage pests. This includes moving or trimming plants or related vegetation so they do not touch buildings, directing water away from foundations, and choosing mulch carefully.





REFERENCES AND RESOURCES

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- Centers for Disease Control and Prevention. (March 2010) *What Is Integrated Pest Management?* Retrieved from www.cdc.gov/nceh/ehs/Docs/Factsheets/What_Is_Integrated_Pest_Management.pdf.
- U.S. Environmental Protection Agency. (February 2015) *Model Pesticide Safety and IPM Guidance Policy for School Districts*. Retrieved from www.epa.gov/ipm/ipm-schools-model-pesticide-safety-and-ipm-guidance-policy-school-districts.
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- www.epa.gov/ipm/integrated-pest-management-tools-resources-support-ipm-implementation
- www.epa.gov/ipm/webinars-about-integrated-pest-management

Pests and Pesticides:

- <http://npic.orst.edu/>
- www.epa.gov/safepestcontrol
- www.epa.gov/pesticides

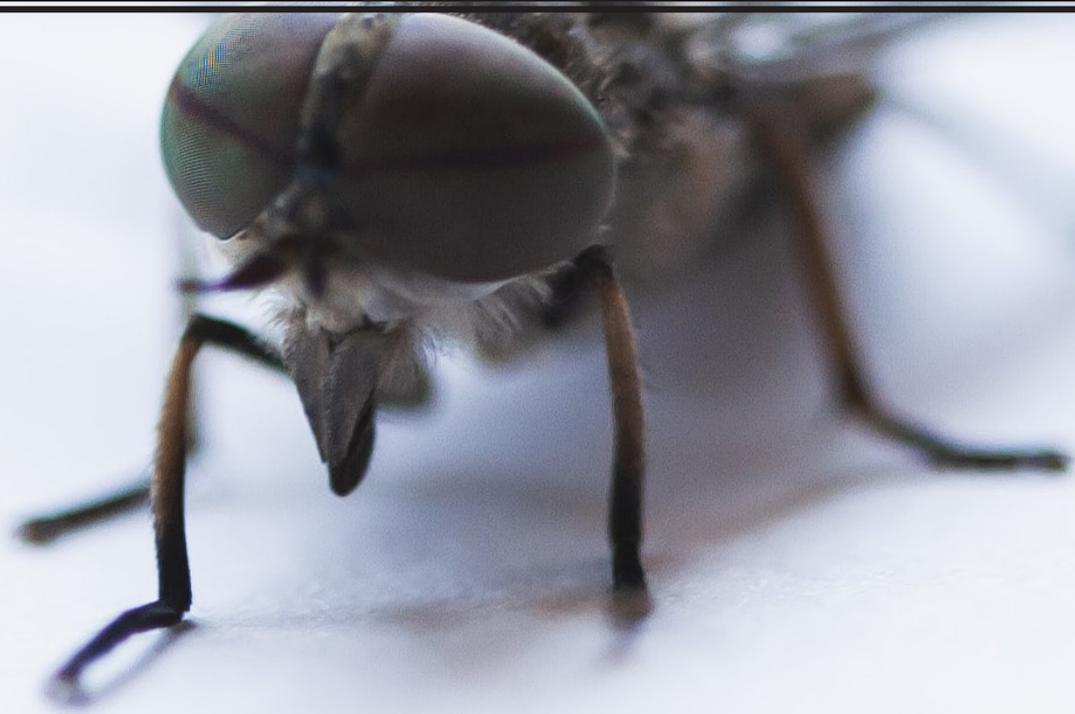
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- Centers for Disease Control and Prevention, U.S. Department of Health and Human Services. (2006) *Integrated Pest Management: Conducting Urban Rodent Surveys*. Retrieved from www.cdc.gov/nceh/ehs/docs/ipm_manual.pdf.
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- www.epa.gov/ipm/rodents-and-schools

Bed Bugs:

- Doggett, S.L., Miller, D.M., Chow-Yang, L. (2018). *Advances in the Biology and Management of Modern Bed Bugs*. Hoboken, NJ: Wiley Blackwell.
- www.cdc.gov/parasites/bedbugs
- www.epa.gov/bedbugs
- U.S. Environmental Protection Agency. (Oct. 23, 2018). Bed Bugs – Considerations for Health Care and Social Services Professionals [video webinar]. Retrieved from <https://register.gotowebinar.com/register/8131468322959250946>.





Mosquitos:

- U.S. Environmental Protection Agency. (November 2019). Mosquitos – Right Trap, Right Place [video webinar]. Retrieved from www.epa.gov/ipm/previous-webinars-about-integrated-pest-management#mosquitoes.
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- www.cdc.gov/mosquitoes

Cockroaches:

- U.S. Environmental Protection Agency. (December 2016). Cockroaches in Your School... You Rarely Find Just One [video webinar]. Retrieved from www.epa.gov/ipm/previous-webinars-about-integrated-pest-management#dec2016.
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Ants:

- <http://npic.orst.edu/pest/ant.html>
- U.S. Environmental Protection Agency. (December 2016). Ants – #1 Pest in Schools [video webinar]. Retrieved from www.epa.gov/ipm/previous-webinars-about-integrated-pest-management#may172016.

Wasps:

- U.S. Environmental Protection Agency. (May 2017). Controlling Yellowjackets and Wasps on School Grounds [video webinar]. Retrieved from www.epa.gov/ipm/previous-webinars-about-integrated-pest-management#may2017-yellow-jacks-wasps.
- www.epa.gov/ipm/bees-and-wasps-and-schools

Flies:

- www.epa.gov/ipm/flies-and-schools





APPENDIX A: Sample IPM Policy

Integrated Pest Management (IPM) Policy

SCOPE

The policy is applicable to [insert name of health care facility].

PURPOSE

To provide pest control and the safest possible application of pesticides approved by the U.S. Environmental Protection Agency (EPA) only as needed.

DEFINITIONS

Identification: Correct pest identification is required to determine the best preventive measures and reduce the unnecessary use of pesticides. Additionally, correct identification will prevent the elimination of beneficial organisms.

Action threshold: The pest population level at which the pest's presence is a nuisance, health hazard, or economic threat. Setting an action threshold is critical to guiding pest control decisions. A defined threshold will focus the size, scope and intensity of an IPM plan.

Prevent pests: IPM focuses on prevention by removing conditions that attract pests, such as food, water and shelter.

Control pests: Pest control is required if action thresholds are exceeded. IPM programs use the most effective, lowest risk options considering the risks to the applicator, building occupants, and environment. Control methods include pest trapping, heat/cold treatment, physical removal, and pesticide application.

IPM team: Designated employees from [insert your IPM team department names here] contributing to ensure commitment to practical pest control with the safest possible use of pesticides, if needed.

POLICY

IPM is a proactive and sustainable approach to managing pests. IPM creates a safer and healthier environment by reducing exposure to both pests and pesticides.

IPM is proactive rather than reactive, eliminating the need for routine and repetitive use of pesticides by focusing on a sequential decision-making process. The IPM process includes:

- Developing pest management goals and objectives with an IPM team;
- Actively monitoring for pests and pest-conducive conditions;
- Identifying the pest and knowing its biology;
- Selecting and implementing multiple, sustainable pest management strategies that emphasize improved sanitation, facility maintenance, pest exclusion, habitat modification, human activity modification, and the development and execution of pre-planned approaches to deal with pest situations; and
- Recording and continually evaluating results to determine if objectives are being met.

Note: IPM does not exclude the use of pesticides, but rather encourages the use of multiple mitigation approaches – and when deemed necessary, the application of pesticides that pose the least risk to people and the environment. Since children, elderly, pregnant women, and immunocompromised individuals are at the greatest risk of injury or negative health impact from exposure to pesticides and pesticide residues, the use of liquid sprays, foggers or volatile formulations should be limited. When necessary, products such as baits, pastes, gels, or crack and crevice treatments should be favored due to lower risks of exposure.

If pesticides are to be used, contact [insert department name and telephone number] to discuss the best time of day and notification to staff regarding the use of pesticides, per environmental health and safety policy.





APPENDIX B:

Sample IPM Procedure

Integrated Pest Management (IPM) Bed Bug Procedure

CRITICAL NOTES!

At [insert name of health care facility]:

It is not necessary to cancel or delay scheduled appointments, procedures, surgeries or exams for patients who report having bed bugs or have confirmed bed bugs.

INTRODUCTION

Early bed bug detection is critical for any health care facility, as bed bugs can disturb patients, create alarm, and lead to decreased patient satisfaction. If there is suspicion of bed bugs, immediate control measures will be taken. It is important to maintain patient dignity and respect when encountering a suspected bed bug introduction.

DEFINITIONS

Introduction of bed bugs: When one or a small number of bed bugs are moved or migrate into a new area (e.g., bug drops off personal item).

Infestation of bed bugs: When a mated female lays eggs and those eggs hatch, feed, grow and reproduce.

EQUIPMENT

- Patient belongings bag
- Plastic totes with lids

IMPLEMENTATION

If there is a suspicion of bed bugs only (e.g., no bugs visualized, only bites observed, patient reports previous history of bed bugs at home):

1. Take standard precautions (transmission-based isolation precautions are not indicated).
2. Maintain an uncluttered environment.
3. Remain vigilant by assessing the environment.
4. No further action is indicated.

If you visualize a bug that is suspected to be a bed bug or patient reports current bed bug infestation in home:

1. Take standard precautions (transmission-based isolation precautions are not indicated).
2. If you visualize a bug, kill the bug and dispose of it.
3. Place non-essential belongings (items other than cell phone, wallet, keys, etc.) in a patient belongings bag sealed with a knot.
 - a. Do not place patient belongings in red plastic biohazard bags or blue plastic linen bags, as these may accidentally be discarded.
 - b. Send sealed patient belongings bag(s) home with patient's family member/caretaker.
 - c. If family member/caretaker is not available:
 - Bag(s) will remain sealed in the room with the patient.





- For storage of items obtain plastic totes with lids.
 - Totes can provide an effective means for prolonged storage of patient belongings in the room.
- d. Upon discharge from the hospital, sealed patient belongings (bags or plastic totes) will be sent home with the patient.
- e. Items are to **REMAIN SEALED** for the duration of the hospitalization.
- 4. Provide clean hospital gown and change patient's linens, if applicable.
- 5. Maintain an uncluttered environment in patient room.
- 6. Remain vigilant by assessing the environment.
 - a. Continue assessing patient's environment to ensure that no bed bugs are found.
 - b. If you visualize a suspected bed bug after initial control measures have been implemented, contact Environmental Services (EVS) and request an EVS Manager consultation for bed bugs.
 - c. Work order for pest control will be made only after EVS Manager approval.
If pest control is utilized, EVS Manager will educate you on next steps for facilitating.
- 7. Provide education:
 - o Educate patient and family members/visitors who reside in a home that has bed bugs to only bring essential items in the health care setting (e.g., cell phone, wallet, keys, etc.).
 - [See online educational resources](#) (available through EPA.gov)

SEMI-PRIVATE ROOM CONSIDERATIONS

- To mitigate negative patient experience, patients with bed bugs should not be roomed in semi-private rooms.
- If patient was already roomed in a semi-private room, implement control measures listed above and transfer patient who is not experiencing bed bugs to a new room.

AMBULATORY CONSIDERATIONS

- Take into consideration patient's appointment and time in the ambulatory setting. If this is a brief appointment, perhaps not all the above control measures are needed. If the appointment is at length or involves a procedure/treatment, the above control measures can be implemented when applicable.

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- Doggett, S.L., Miller, D.M., Chow-Yang, L. (2018). Advances in the Biology and Management of Modern Bed Bugs. Hoboken, NJ: Wiley Blackwell.
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