



Healthy Hospitals: Managing Facilities Without Toxic Pesticides Through Integrated Pest Management (IPM)

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Presented by

Jay Feldman, Beyond Pesticides

Tom Green, IPM Institute

Lionel Weeks

Moderated by

Practice Greenhealth

Learning Objectives

Participants will be able to:

- i. Identify the hazards, especially for more vulnerable and at-risk patient populations, associated with conventional pest management practices that rely on pesticide use in and around health care facilities
- ii. Demonstrate competency in recognizing and understanding the efficacy and benefits of defined, least-toxic integrated pest management and organic land care systems that minimize hazards and improve pest management performance and outcomes
- iii. Develop goals and execute effective IPM policies and strategies for contracted pest services and interdepartmental communication and cooperation for achieving IPM
- iv. Integrate green pest management goals that minimize toxic exposure risks into broader sustainability goals for their facility

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Presenters

- Jay Feldman, Executive Director, Beyond Pesticides. Jay is a cofounder of the organization and has served as its director since 1981. Jay has helped to build Beyond Pesticides' capacity to assist local groups and impact national pesticide policy. He has tracked specific chemical effects, regulatory actions, and pesticide law. He is very familiar with local groups working on pesticides and has helped develop successful strategies for reform in local communities.
- Tom Green

- Lionel Weeks, Vice President of Facilities, Lifebridge Health. Lionel, who was recently elected vice chair of Maryland Health Care Sustainability Leadership Council (HCSLC) which was established this year to provide guidance and advice to hospital leaders who want to reduce waste while increasing fresh local foods, has been involved with the greening and sustainability efforts of LifeBridge Health for the past four years.

Jay Feldman

**Executive Director, Beyond Pesticides
Washington, D.C.**

IPM in Health Care Facilities Project

A joint project of Beyond Pesticides and Maryland Pesticide Network

Beyond Pesticides

IPM in Health Care Facilities Project Mission:

To protect the health of vulnerable patients and staff from the dangers of toxic pesticides through toxic-free pest management that promotes healthy indoor and outdoor environments

Why look at Hospital Pest Management Practices?

Create a facility free of pests and hazardous pesticides in order to protect people who are at the highest risk because of:

- immune and nervous system weakness
- those with breathing problems
- allergies and reactions to chemicals

Protect facility staff from occupational exposure to toxic chemicals



Why Reduce Pesticide Use?

Vulnerable Groups

- infants and children
- pregnant women/fetuses
- the elderly
- compromised immune and nervous systems
- those with asthma or respiratory problems
- cancer patients and survivors
- those sensitive to chemicals

Precaution

IPM is a
commitment to
precaution.

IPM is a
commitment to
measures that
prevent pests and
the need for toxic
chemicals.



What is IPM?

Integrated Pest Management is a commitment to measure that prevent pests and the need for toxic chemicals.

Integrated Pest Management is a commitment to precaution.

What is IPM?

IPM is a pest management strategy that provides long-term pest prevention and suppression through a combination of practices such as:

- Regular pest population monitoring
- Site inspections
- Occupant education
- Structural, mechanical, cultural, and biological controls

Least-toxic pesticides are only used as a last resort

IPM and Pest Hazards

Flies carrying infectious diseases can feed on feces, garbage in one minute, and on patient food the next.

Flies carry staph, *E. coli* and *Salmonella*.

IPM can eliminate fly breeding areas and entryways into a facility



IPM and Pest Hazards



Rodents need water, grease and cardboard to survive and can cause viruses (Hantavirus, typhus, SARS).

Mice can chew on wires, causing shorts and fires.

Proper IPM implementation removes cardboard, fixes water leaks, and encourages cleaner surfaces

IPM and Pest Hazards

Cockroaches like water, food and cardboard and are asthma triggers. They carry germs.

With IPM, the food, water, and shelter that cockroaches enjoy will be eliminated.



IPM and Pest Hazards



Birds can carry viruses and other diseases.

Airborne droppings can cause *histoplasmosis*.

IPM reduces the food sources that attract birds to buildings.

What is a Pesticides?

Pesticides are designed to kill or repel insects, plants and animals that are unwanted or that threaten human health.



Dangers from Pesticides



“Particular uncertainty exists regarding the long-term health effects of low dose pesticide exposure...

Considering [the] data gaps, it is prudent ... to limit pesticide exposures ... and to use the least toxic chemical pesticide or non-chemical alternative.”

- *AMA, Council on Scientific Affairs. 1997*

Dangers from Pesticides



“Pest management in health care facilities differs from control practices in other institutions.

The effect on patients in various stages of debilitation and convalescence, and in varied physical and attitudinal environments, requires that a cautious policy be adopted concerning all uses of pesticides.

The use of any pesticide establishes a risk of uncertain magnitude.”

- Department of Veteran Affairs. 1986. Pest Management Operations, Chapter 2. Environmental Management Service

Dangers from Pesticides



The general public receives limited and misleading information on pesticide hazards" and is misled on pesticide safety by statements characterizing pesticides as "safe" or "harmless."

**- U.S. Government Accountability Office.
1997. *Nonagricultural Pesticides: Risks
and Regulation. GAO/RCED-86-97.***

Dangers from Pesticides



2009 National Report on Human Exposure to Environmental Chemicals

- The report presents exposure information for 212 environmental chemicals measured in blood and urine specimens.

- 75 chemicals were measured for the first time in the U.S. population, including the antibacterial pesticide triclosan
- Organophosphate and pyrethroid pesticide levels are twice as high in children than adults.
- Most U.S. residents have detectable levels of 2,4-D, DDT, DEET, triclosan, and several organophosphates and organochlorines or their metabolites.
- DDT is still detected in the bodies of U.S. residents, more than thirty years after the 1973 ban.

Why Don't Our Laws Adequately Protect Us?

National Pesticide Laws

Passed by U.S. Congress

Federal Insecticide, Fungicide and
Rodenticide Act (FIFRA), 1972

Food Quality Protection Act (FIFRA), 1996

And State Laws...

Risk Assessment

What's In a Number?

Risk values are often stated, shorthand-fashion, as a number. When the risk concern is cancer, the risk number represents a probability of occurrence of additional cancer cases. For example, such an estimate for Pollutant X might be expressed as 1×10^{-6} , or simply 10^{-6} . This number can also be written as 0.000001, or one in a million—meaning one additional case of cancer projected in a population of one million people exposed to a certain level of Pollutant X over their lifetimes. Similarly, 5×10^{-7} , or 0.0000005, or five in 100 million, indicates a potential risk of five additional cancer cases in a population of 100 million people exposed to a certain level of the pollutant. These numbers signify incremental cases above the background cancer incidence in the general population. American Cancer Society statistics indicate that the background cancer incidence in the general population is one in three over a lifetime.

If the effect associated with Pollutant X is not cancer but another health effect, perhaps neurotoxicity (nerve damage) or birth defects, then numbers are not typically

1×10^{-6}

0.000001

given as probability of occurrence, but rather as levels of exposure estimated to be without harm. This often takes the form of a reference dose (RfD). A RfD is typically expressed in terms of milligrams (of pollutant) per kilogram of body weight per day, e.g., 0.004 mg/kg-day. Simply described, a RfD is a

rough estimate of daily exposure to the human population (including sensitive subgroups) that is likely to be without appreciable risk of deleterious effects during a lifetime. The uncertainty in a RfD may be one or several orders of magnitude (i.e., multiples of 10).

What's in a number? The important point to remember is that the numbers by themselves don't tell the whole story. For instance, even though the numbers are identical, a cancer risk value of 10^{-6} for the "average exposed person" (perhaps someone exposed through the food supply) is not the same thing as a cancer risk of 10^{-6} for a "most exposed individual" (perhaps someone exposed from living or

working in a highly contaminated area). It's important to know the difference. Omitting the qualifier "average" or "most exposed" incompletely describes the risk and would mean a failure in risk communication.

A numerical estimate is only as good as the data it is based on. Just as important as the *quantitative* aspect of risk characterization (the risk numbers), then, are the *qualitative* aspects. How extensive is the data base supporting the risk assessment? Does it include human epidemiological data as well as experimental data? Does the

laboratory data base include test data on more than one species? If multiple species were tested, did they all respond similarly to the test substance? What are the "data gaps," the missing pieces of the puzzle? What are the scientific uncertainties? What science policy decisions were made to address these uncertainties? What working assumptions underlie the risk assessment? What is the overall confidence level in the risk assessment? All of these qualitative considerations are essential to deciding what reliance to place on a number and to characterizing a potential risk.

—Eds.

10^{-6}

Complexities Not Address by the Regulatory Process



- Mixtures
- Synergistic effects
- Inerts, metabolites and contaminants
- Endocrine disruption
- Assumes 100% compliance
- Arbitrary exposure assumptions
- No monitoring of adverse effects
- Additional margin of safety sometimes arbitrary
- Uncertainties/limitation of risk assessment not disclosed on products

Effects of Pesticide Use

37 Commonly Used Pesticides

Health Effects	Ecological Effect
16 are likely, probable, or possible carcinogens	9 are groundwater contaminants
13 are linked to birth defects	12 can leach through soil
15 are reproductive toxins	14 are toxic to birds
18 cause kidney or liver damage	30 are toxic to aquatic life
28 are sensitizers/irritants	16 are toxic to bees

Hospital Pesticide Use Survey:

The Good News:

73% report using IPM

45% use one or more boric acid products

27% provide pesticide poisoning training

14% post notification signs for indoor & outdoor applications

IPM Assessment in Healthcare Facilities

Survey (indoor and outdoor)

- Vendor relationship/oversight
- Staff knowledge base regarding pesticides
- Pest Issues
- State of IPM practice
- Pesticide use (chemicals, volume, and frequency)

IPM Implementation

Eliminate Food - Restrict Entry - Control Habitat

Inspect - Detect - Correct

- Sanitation
- Vacuuming
- Pest proofing waste disposal
- Structural maintenance
- Mechanical traps

Least Toxic Pesticides

- Boric acid (borates, disodium octaborate tetrahydrate)
- Diatomaceous earth / silica gel
- Microbe-based insecticides (B.t.)
- Soap-based products
- Non-volatile insect and rodent baits
- Liquid nitrogen (cold treatments)
- EPA Exempt natural pesticides (FIFRA 25(b))

Opportunities

- Staff Opportunities
- Institutional Policy and Plan
- Interdepartmental coordination
- Vendor responsiveness and commitment
- Oversight/Quantity Assurance

Tom Green

IPM Institute



2009 IPM Excellence Award
2009, 2008, 2005, 2004 US EPA Pesticide Environmental Stewardship National Champion
2005 US EPA Children's Health Recognition Award Winner
2003 US EPA Region V Recognition Award Winner

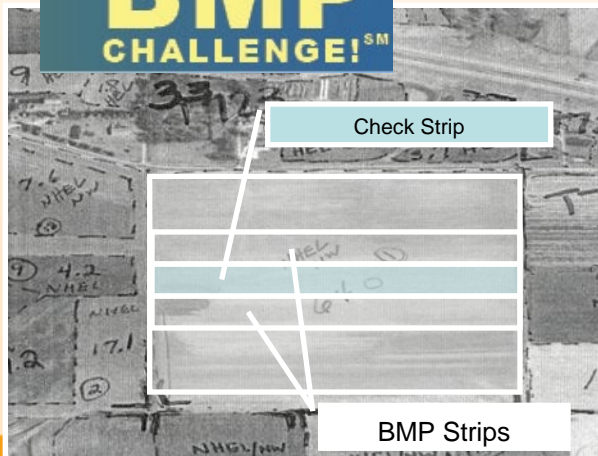
Harnessing marketplace power to improve health, environment and economics



Agriculture



Communities



Seventh International IPM Symposium, March 2012



Pests are serious threats

- ❖ **Flies:** Feed on feces, garbage in one minute, and on patient/staff food the next. Flies carry staph, E. coli and Salmonella.
- ❖ **Cockroaches:** Cause asthma and trigger attacks. They carry germs that can cause pneumonia, diarrhea and food poisoning.
- ❖ **Rodents:** Transmit hantavirus, typhus, SARS. Mice chew on wires, causing shorts and fires.
- ❖ **Birds:** Carry viruses and other diseases. Airborne droppings can cause histoplasmosis.

Two things about IPM

- IPM is a **continuum**. We're all doing some IPM. High-level IPM is focused on prevention. Why is the pest there? Don't treat symptoms, solve underlying problems.
- IPM is people management! IPM can't be contracted out to a service provider – everyone has role to play including management, maintenance, custodial, food service...

*Winner:
Not my job award*

IPM is everyone's job!



IPM works!



- 50% reduction in roach populations in public housing. (Environmental Health Perspectives)
- 95% reduction in roach infestation and allergens in low-income housing. (US EPA)
- Cockroach allergens 100x level of concern in conventional schools, negligible in IPM schools. (NC State)
- **Up to 28% of kids in urban centers have asthma! 6% nationally and growing. *Cockroaches, rodents, dust mites, pesticides.***

Why? Solving problems at the source, not treating symptoms...

pests are best predicted by the condition of homes, not the use or nonuse of pesticides.

Housing characteristic		% with rodents
Cracks/holes in interior	Yes	37.6
	No	7.7
Interior leaks in past year	Yes	35.8
	No	13.1

Critical areas?

Think food, water, shelter

- 🌱 Kitchen, food storeroom, cafeterias
- 🌱 Staff lounges/break rooms
- 🌱 Lavatories, locker rooms
- 🌱 Custodial storage rooms
- 🌱 Mechanical rooms
- 🌱 Laundries
- 🌱 Dumpsters
- 🌱 External grounds

Common deficiencies in health care

- Rats, mice, cockroaches, ants, flies and pigeons are typical pests. Stinging insects, termites, spiders, feral cats occasionally cause problems.
- A wide variety of pesticide products are used with no formal evaluation of toxicity and exposure hazard.
- Responsibility for a pest and pesticide-free environment is delegated rather than shared.

Continued

- Putting up with pests is common. “It would be a lot worse if we weren’t spraying once a week.”
- Pest management is a low priority and gets upper management attention only when a problem occurs. Lack of proactive planning, policies, prevention.
- Pest management doesn’t happen during construction, “building in” pest problems.



Drain cleaning procedures and frequency often need improvement indoors and out to prevent fly breeding as well as food sources for ants, cockroaches.



Indoor drains should



**Mouse droppings behind microwave.
Mice urinate hundreds of times and
defecate 50-60 times per day.**

Would you like fries with that?

**Mouse problems are solvable and
should not be tolerated.**



Hard-to-reach places underneath equipment and storage racks often needs more regular and thorough cleaning to resolve “pest feeding stations.”



Clutter under desks make it impossible to clean the floor and provides harborage for mice. If staff eat at their desks, all food should be stored in sealed containers and trash emptied at end of day so as not to leave food/garbage overnight.



Storage practices need improvement; clutter prevents adequate cleaning



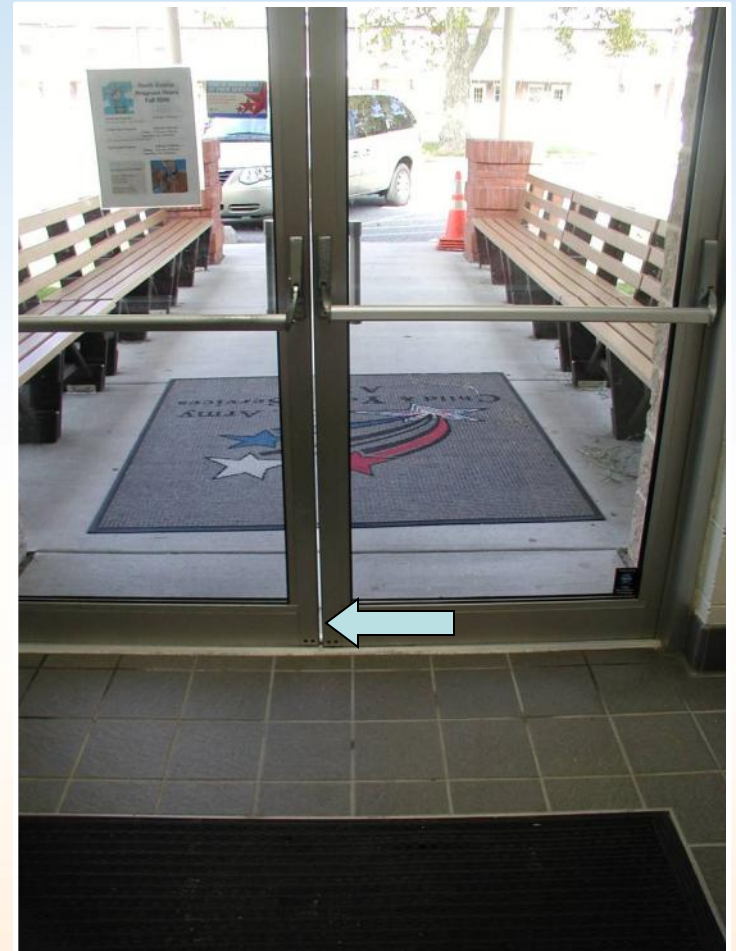
Annual “cleanout days” where rolloff trash bins are brought in for unused items can help reduce unnecessary storage, clutter and seismic event hazards.

Six inch inspection aisles should be maintained between walls and stored items.



Exclusion

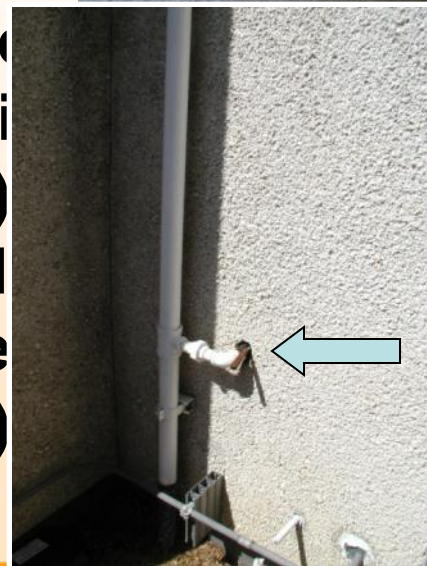
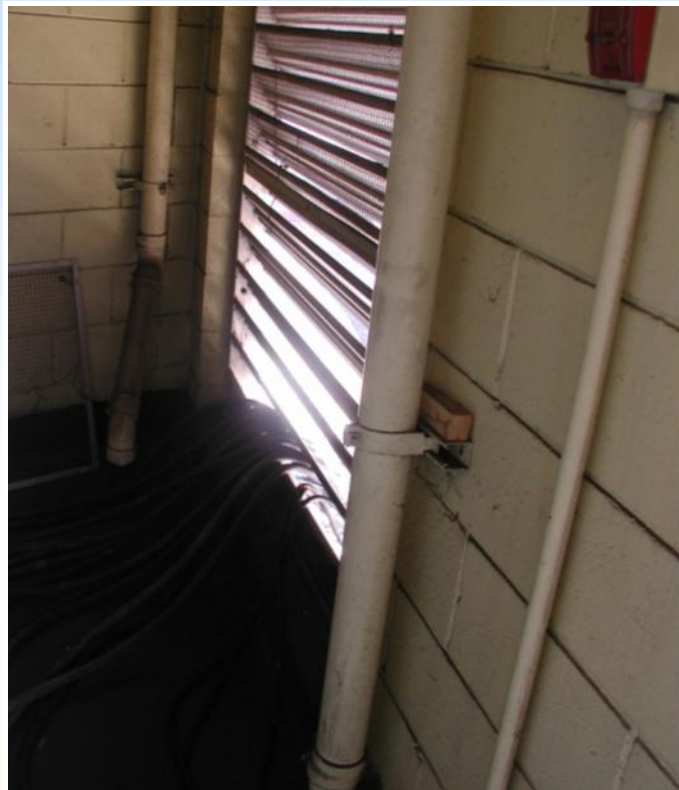
Harborage, sheltered travel ways, no door if I'm a rat, mouse, snake, ant, etc.



Effective door sweeps and seals can cut pest complaints by 65%. How much energy could be saved by fixing the door? How much dirt would be kept out?



Exterior inspections should note and correct any openings. Ants can enter any opening; mice need 1/4" (pencil diameter); rats need 1/2" (nickel diameter) holes.





Leaks and spilled trash around compactors, dumpsters and loading dock areas provide rodent food and water sources as well as fly breeding sites.

These areas should be

Pest problems and unauthorized pesticide use are serious liabilities that should be reported and resolved immediately.



Over-the-counter No Pest Strip hung by employees at their smoking station to address fly problems are not effective, unsafe and illegal in many situations.



Move trash cans and dumpsters away from doorways to reduce attracting flies and stinging insects to entranceways.

Specs for trash can liners should be adequate to reduce ripping and spills. Specs for outdoor trash cans should include spring-loaded doors.

Exterior doors should not be left or propped open to reduce pest entry.



This can is a rat cafeteria and should be replaced with one with a spring-loaded door, or at least emptied just before dusk each day to reduce rat access to food.



Vegetation up against buildings invites ants, mulch against building invites ants, rodents.

Ants feed on aphid excrement, or “honeydew”. When plant growth slows, aphid numbers decline and ants will climb from the vegetation onto buildings in search of food.





Untrimmed or low growing plants provide rodents with cover.



Moderately mulched upright plants (above foreground, above right) are ideal. Shrubs can be trimmed to expose ground/mulch, like those below.

Vegetation should be selected and managed to keep ground exposed, discourag



Unnecessary pesticide use

Why use a pesticide here? Treating the symptom and not the cause. More efficient for everyone involved if the hole is sealed.

Installer did not make the job easy. A little education could go a long way.



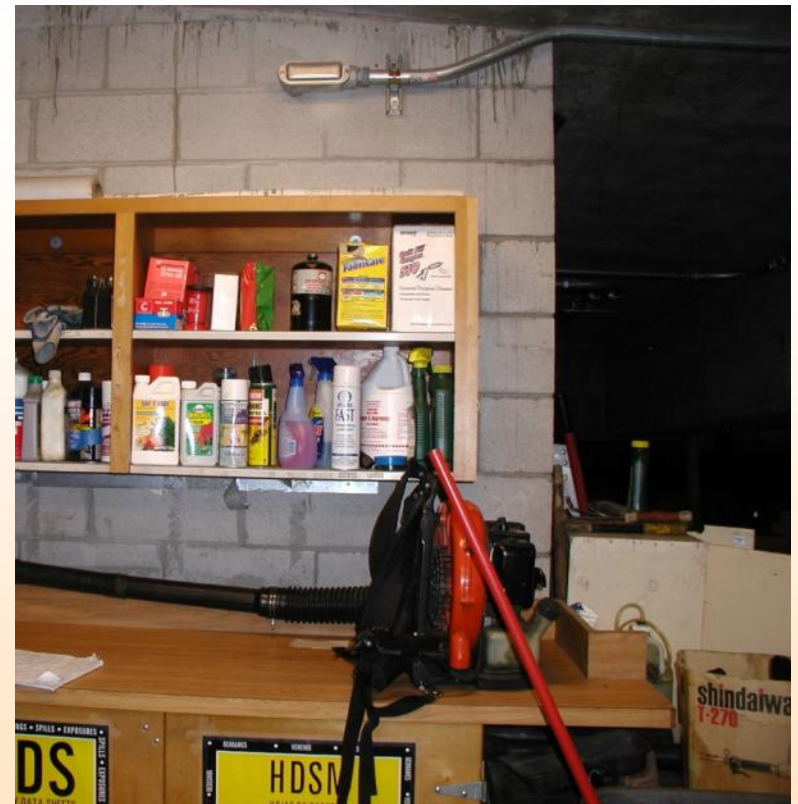
Poor control practices

Live catch trap left behind to trap mice and feed cockroaches.



Where are pesticides stored?

Monitor and improve pesticide, fuel and fertilizer storage. Properly dispose of unused/obsolete products. Separate fuel and fertilizer. Remove fuel to locked outside metal cabinets. Separate insecticides, herbicides and fungicides. Place liquids below dry product. Add signage, check with fire department on inventory/ emergency mgt. requirements. Update MSDS list.

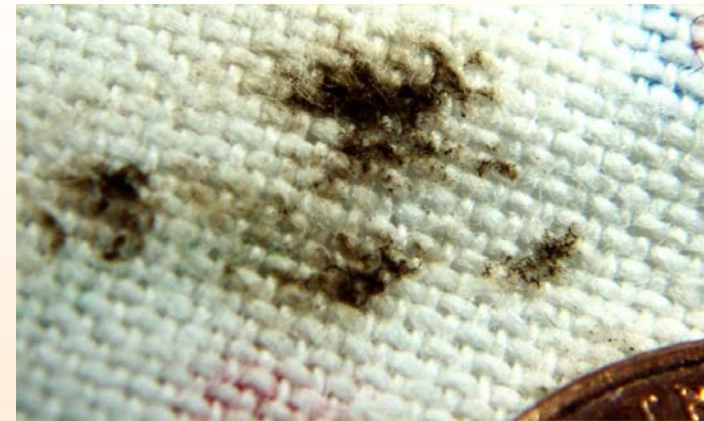


Who needs to be involved?

- Everyone!
- Architects, carpenters, clerical, custodial, engineering, food service, landscape architects, landscapers, upper management, operations, pest management, plumbers, waste management...
- Do what you're doing, just think pest! And save water and energy, improve security, etc.

Bed bug basics

- Adults apple seed-shaped
- Brown to reddish brown
- About ½ cm in length
- Travels up to 20 feet to feed
- Prefers human blood
- Feed every 3-4 days
- Three to ten minutes per feeding
- May or may not leave itchy welt
- Fecal staining on bedding









Unlike mosquitoes, ticks, fleas

- Bed bugs are not known to carry diseases.
- Social stigma
- Litigation/liability
- Anxiety, loss of sleep



Best practices: Prevention

- Bed bugs can travel on clothing, luggage, backpacks, wheelchairs, other belongings.
- Evaluate and isolate. Clear plastic bags or tight-closing bins are ideal.
- Follow the source. Homes? Shelters? Just like head lice, body lice.



Best practices: Prevention

- Reduce harborage.
- Use mattress, box spring and pillow encasements.
- Furnishings without gaps.
- Metal, gloss paint, white color.
- Train staff to recognize/respond appropriately.
- Preventive inspections.



Best practices: Treatment

- Vacuuming. Very effective in reducing numbers. Seal and dispose of bag.
- Laundering, high temp drying.
- Freezing. Takes several days.
- Steam. Diffuse stream.
- Heat. Very effective, challenging for large, open areas.



Best practices: Treatment

- Preparation very important:
 - Pull furnishings away from walls.
 - Remove/loosen items attached to walls including headboards, pictures, mirrors, etc.
 - Loosen carpet.
- Very important to inspect adjoining rooms.



Best practices: Pesticides?

- Pesticides containing diatomaceous earth.
- E.g., Mother Earth D
- Very effective, slow acting (up to 10 days), very long residual.
- Respiratory irritant. Use only where will not become airborne.



Where to from here?

- Designate and train an IPM coordinator at management level who can direct implementation of the IPM policy and plan, including coordinating activities and roles by service providers and all key staff.
- Ongoing staff, contractor training.
- Assess your situation. Use a third-party expert to evaluate, identify and prioritize your issues, provide training.

Lionel Weeks

Vice President of Facilities

Lifebridge Health

Baltimore, Maryland

Why IPM in the Hospital?

- IPM reduces harmful chemicals for patients, staff, and the environment through the adoption of green practices.
- Pesticides treat but do not solve or prevent pest issues.
- IPM creates a facility that is free of pests and hazardous pesticides to protect people who are at the highest risk in the hospital environment.

Understanding Pest Management at our Facilities

- Joined the IPM in Health Care Facilities Project as a pilot
- Surveyed Pest Management practices and pesticide use
- Evaluated log books on pest complaints
- Met with pest management technicians and supervisors

Adopting an IPM Policy

“LifeBridge Health’s pest management policy is Integrated Pest Management (IPM) that prevents and responds to pest problems with strategies and methods that pose the least possible hazard to people, property, and the environment... At LifeBridge Health, least-toxic pesticides are only used as a last resort after non-toxic options for resolving pest problems have been exhausted or are deemed unreasonable.”

– From the official Integrated Pest Management Policies and Procedures, LifeBridge Health, Adopted August, 2009

Starting an IPM Program

There are many objectives of an IPM program. These objectives include:

- **Education** – when staff understand their role maintaining a pest free facility without the use of toxic chemicals; understanding the difference between IPM and conventional pest management
- **Communication** - when the technician identifies pest conducive conditions at the health care facility
- **Coordination** - establishing a mechanism to address problems that attract pests

IPM Coordination

To effectively implement an IPM program it was essential to establish an IPM coordinator position.

The IPM coordinator is responsible for:

- Track actions of pest management technician
- Review technician and complaint logs
- Coordinate addressing pest conducive conditions identified by technician
- Periodically accompany technician on walk-through of facility
- Approve use of least toxic pesticide when necessary as a last resort
- Oversee contract agreements with vendor

IPM Coordination

IPM Coordinator ensures coordination and communication is needed between:

- Environmental Services/Housekeeping
- Maintenance
- Construction
- Pest management technician
- Vendors

IPM in the hospital

Before IPM Implementation

No understanding of what chemicals are applied by the technician

No cooperation of hospital staff and hospital departments to deal with prevention of pest problems

Limited understanding of how cleaning clutter and cracks contribute to pest problems

After IPM Implementation

Technician works and communicates with vendors, maintenance, housekeeping to ensure a pest free environment

Greater understanding by all hospital staff of what is applied when a product is needed

The hospital becomes a cleaner, healthier place, with less clutter, cracks, and cleaner conditions

Working with the Technician

Hospital Staff must be made aware of the conditions at the hospital

This example log shows positive work by hospital staff. There are no pests, no pesticide applications, and no recommendations

If there are pests, the technician will identify the conditions conducive to pests, list the chemical or non-chemical actions, and list recommendations for the hospital to eliminate the pest conducive conditions.

[Redacted] Western Office [Redacted]

Date [Redacted] Western Office [Redacted]

Customer [Redacted] Address [Redacted]

Address [Redacted] City/State/Zip [Redacted]

City/State/Zip [Redacted] Phone [Redacted]

To assure you that all laws, regulations and rules are followed, this Log Report has been established and must be completed each service. The service technician must indicate on this report locations and all pesticides used. These reports should be kept in the Western Log Book by a person designated by your company for easy reference when needed. Additional copies of this report will be retained by Western for further evaluation.

LOCATION OF APPLICATION	TYPE OF PEST	PESTICIDE USED			LOCATION OF APPLICATION	TYPE OF PEST	PESTICIDE USED		
		Code	Dosage	Amount			Code	Dosage	Amount
Curtain	Pgs								
Laundry	Pgs								
Maintenance	Pgs								
Central Supply	Pgs								
Common Areas	Pgs								

Codes Used were taken from Western Pesticide Code List on the Reverse Side:

Service Summary: I inspected the building. No pest problems were observed or reported.

Outside Contributing or Conducive Conditions:
No problems to report

Recommendations:
No recommendations

URGENT! NEEDS IMMEDIATE ATTENTION

Time In: 11:15 Time Out: 2:10

Western hereby acknowledges that this report is an integral part of the service provided.

Technician's Signature: [Redacted]

Customer's Signature: [Redacted]

Pgs-regular Pest Services

R104 Rev. 3/11 CUSTOMER COPY

Conclusion

Ongoing efforts are necessary to change the culture of pest management in health care facilities so that everyone in the facility understands their role in preventing those conditions that contribute to pest problems. In this culture, the pest management technician helps identify problems and coordinates with the facility departments to address them.

IPM is a collective effort that only works when everyone is pitching in.

Questions?

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