



BRIEFINGS ON HOSPITAL SAFETY

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Decorative fountains pose safety risk for hospitals

Fountains linked to Legionella outbreak

Despite their aesthetic qualities, more hospitals are finding decorative fountains to be a risky addition to the healthcare setting. Some epidemiology experts have even recommended healthcare facilities eliminate the fountains altogether, given their propensity for harboring dangerous pathogens.

Results from a report published in the February issue of *Infection Control and Hospital Epidemiology* indicate that routine cleaning and maintenance of fountains does not adequately eliminate the risk of bacterial contamination. The study conducted an epidemiologic investigation of an acute outbreak among visitors in a Wisconsin hospital during February and March 2010 that infected five visitors and three outpatients.

“There is really no specific procedure that will, with 100% assurance, eliminate the risk of bacteria contamination from these foundations, and unfortunately

these fountains are becoming more and more popular,” says **Thomas Haupt, MS**, an epidemiologist with the Wisconsin Division of Public Health and the study’s lead author.

This report is an unfortunate but very real summation of the present state of *Legionella* control, says **Tim Keane**, consultant for Legionella Risk Management, Inc., author

of *Guidelines for Control of Legionella in Ornamental Fountains*, and a member of the ASHRAE standard committee that has developed a pending standard for

Legionella control. He also authored Chapter 5 of *HCPPro’s Infection Control During Construction Manual: Policies, Procedures, and Strategies for Compliance*, Third Edition, which covers waterborne pathogens.

“This was not a ‘perfect storm’ of unanticipated events—this was an accident waiting to happen,” says Keane. “What’s surprising is that it took two years to happen.”

In this case, the fountain design had three sources of heat, which contributes to pathogens: submerged lighting, accent lighting, and placement next to an electric fireplace. The fountain also had a submerged pump, which added to the heat load, Keane says.

“The research from this paper should be a strong wake-up call to the healthcare industry,” he says.

However, Keane notes that the study lays too much blame on the fountain itself, and doesn’t place enough emphasis on proper maintenance and testing, which is imperative when it comes to any indoor ornamental water structure.

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Heat may replace chemicals in the fight against bedbugs

Traditional pesticides have shown to be toxic to humans, opening the door for safer and more effective treatments using heat

Bedbugs are an issue that many hospitals encounter, but few want to talk about. Usually the tiny critters provoke thoughts of seedy motels or dirty mattresses, but in truth, even the cleanest environment can have an infestation—and sometimes it's not apparent until it spirals out of control.

For that reason, hospitals encountering a problem with bedbugs need a quick and efficient way to detox patient rooms with minimal disruption.

In the past, hospitals have relied heavily on chemical treatment of bedbug infestations, but recent reports have shown that bedbugs may be building up resistance to these chemicals, and heat-based treatments may offer a more effective and safer solution.

Now the Centers for Disease Control and Prevention (CDC) has thrown its support behind the use of heat treatments in place of chemicals. The September 23, 2011, *Morbidity and Mortality Weekly Report* indicated that bedbug infestations are increasing in the United States and internationally. However, the bedbugs' growing resistance to insecticides has led to a greater use of chemicals, which can have potentially harmful effects on humans.

"Bedbug infestations often are treated with insecticides, but insecticide resistance is a problem, and excessive use of insecticides or use of insecticides contrary to label directions can raise the potential for human toxicity," according to the report.

Research conducted by the CDC from 2003 to 2010 showed 111 cases of illnesses from insecticides in seven states. The most common contributing factors included:

- Excessive insecticide application
- Failure to wash or change pesticide-treated bedding
- Inadequate notification of pesticide application

The CDC recommends more judicious use of chemicals and calls for insecticide labels that are easier to read and understand in order to prevent overuse, which can

lead to illnesses associated with bedbug control. The agency also recommends increasing hospital awareness of nonchemical interventions for dealing with bedbug infestations.

The use of heat is among the more effective non-chemical treatments that have proven useful in the healthcare environment, where chemicals present a greater degree of danger to immunosuppressed patients.

"The CDC has been very positive about the use of heat instead of chemicals because the chemicals are injuring people," says **David Hedman**, president and CEO of ThermaPureHeat in Ventura, CA. "Needless to say it's a sensitive area where people are bedridden or sleeping, particularly in children whose faster metabolism may increase their propensity for chemical injury."

The downside to pesticides

As the CDC notes, bedbugs can develop a resistance to chemical treatments, forcing pest control companies to use stronger chemicals or multiple treatments.

Pesticides usually don't eradicate infestations in a single treatment, since they kill the adult bugs that come in contact with the chemical but do not affect the eggs; thus, another chemical treatment is required to completely eliminate the problem, says **Larry Chase**, vice president of ThermaPureHeat.

"What we are seeing is pest control operators try and solve that problem by applying more chemicals, which makes it worse from a health standpoint," Chase says.

More frequent use of stronger chemicals further increases bedbugs' resistance to those chemicals, prompting pest control managers to employ even stronger pesticides that pose a greater risk to human health.

The process of heat treatment

Heat-based treatments essentially pasteurize the entire treatment area, raising temperatures to 100°–130°F and

sometimes as high as 170°. Heating an area to pasteurization levels allows the heat to penetrate walls and cavities, completely eradicating the infestation in the area. ThermaPureHeat also uses thermal imaging to ensure all areas of the affected space reach the appropriate heating levels.

“If there is a cold spot, we could fail, so thermal imaging is a powerful tool for use to make sure that that entire area reaches the required temperature,” Hedman explains.

The treatment process typically takes from four to eight hours depending on the size and shape of the room. “It depends on the complexity of the space, how easy it is to get the heat into the space, how many things need to be protected, how many things need to be removed, or if anything does need to be removed,” Chase notes. “So it will vary, but a very simple space can be done quite quickly.”

Heat also has the advantage of killing all life stages of bedbugs, even eggs, which are microscopic and difficult to identify.

Treating an outbreak quickly

For healthcare facilities, speed is key to treating a bedbug problem. Infestations often occur in an entire unit,

rather than an isolated area—and to make matters worse, indications of bedbugs, such as bites, usually don’t appear until the infestation is widespread. “It typically isn’t until we have a major infestation that we begin getting visual sightings from staff and patients,” Hedman says.

Adult bedbugs can lay 500 eggs over their lifetime (typically one year), meaning it only takes a few months for a full-blown outbreak to develop.

“One of the things we do is clearly identify the size and the spread of the infestation so you know you are treating the appropriate spaces,” Chase says. “A lot of times what happens is someone will make a determination that a bedbug is in a certain room and they will only try and treat that room without looking to see if the infestation is spread beyond that. So part of the control measure is determining the size of the problem.”

In some situations, dogs are used to determine the size and scope of an affected area, Hedman says. Bedbugs give off a specific scent or pheromone; canines can be used to detect this scent and determine whether an infestation is limited to just a couple of rooms, or whether it’s manifested into a bigger problem. As soon as hospitals identify an infestation, they should isolate the area. ■

The things they carry

A study published in May 2011 in the Centers for Disease Control and Prevention (CDC) *Emerging Infectious Diseases* indicates that bedbugs themselves may not be the only worrisome part of an infestation.

Researchers in Vancouver, British Columbia, studied bedbugs taken from three patients treated at St. Paul’s Hospital in Vancouver and found the bugs were carrying traces of MRSA and VRE. “These insects may act as a hidden environmental reservoir for MRSA and may promote the spread of MRSA in impoverished and overcrowded communities,” study authors wrote. “Bedbugs carrying MRSA and/or VRE may have the potential to act as vectors for transmission.”

Another study, published June 2011 in *Indoor Air, the International Journal of Indoor Environment and Health*,

reaffirmed some of these concerns. Researchers from Natural Link Mold Lab demonstrated that bedbugs were capable of carrying microbial pathogens.

Although neither study was able to prove that the bedbugs actually transmitted disease, it was previously thought that bedbugs didn’t carry such pathogens at all. Thus, the findings from these studies indicate that patients may be at greater risk in the event of a bedbug outbreak.

The studies may serve as another reason for hospitals to consider heat-based treatment over the use of chemicals. Pasteurizing rooms can kill the bedbugs along with potentially dangerous pathogens they may be carrying.