Insects in Hospitals: Definite Ick, Unclear Risk

Written by The Life Science Feed Editorial Team · Published 1 July 2026 · Edited by William Lopes

The presence of insects within healthcare environments is a frequently reported issue, raising immediate concerns regarding hygiene and patient safety. Despite the intuitive perception of risk, the direct epidemiological link between insect presence and the transmission of healthcare-associated infections (HAIs) is not definitively established. This article examines the current understanding of insect vectors in hospitals and the evidence base for their impact on patient outcomes.

KEY TAKEAWAYS

- The Pivot: While insects are common in hospitals, their direct role in HAI transmission is not fully quantified.
- The Data: Specific data on insect-mediated HAI rates are scarce, with most evidence being observational or theoretical.
- The Action: Clinicians should adhere to established infection control protocols, focusing on environmental hygiene and pest management as part of a broader strategy.

Healthcare facilities, by their nature, present complex environments where infection control is paramount. The presence of insects, such as flies, cockroaches, and ants, is a perennial challenge in these settings. While the immediate reaction to such sightings is often one of disgust and concern for contamination, the precise mechanisms and quantifiable risks associated with insect-mediated pathogen transmission in hospitals remain an area with limited direct evidence. Most of the current understanding is derived from observational studies, theoretical models, and extrapolation from community settings rather than direct, controlled trials within hospital environments. The primary concern stems from the potential for insects to act as mechanical vectors, transferring pathogens from contaminated surfaces, waste, or infected individuals to patients, medical equipment, or sterile areas. This mechanical transfer does not involve biological replication of the pathogen within the insect, but rather the physical carriage of microorganisms on their external surfaces, legs, or through their digestive tracts and subsequent regurgitation or defecation.1

Common insect species encountered in hospitals include various fly species (e.g., house flies, blowflies), cockroaches (e.g., German cockroach, American cockroach), and ants. These insects are attracted to food sources, moisture, and warmth, all of which are readily available in healthcare settings. Flies, for instance, are known to frequent decaying matter, faeces, and open wounds in other contexts, making their presence in a hospital particularly concerning. They can pick up bacteria such as Escherichia coli, Staphylococcus aureus, and Pseudomonas aeruginosa on their bodies and transfer them to surfaces or food. Cockroaches are similarly implicated in carrying a wide range of bacteria, fungi, and viruses. Their nocturnal habits and ability to hide in cracks and crevices make their eradication challenging. Ants, while often perceived as less problematic, can also carry pathogens and contaminate sterile supplies or food items if they gain access.1

What the evidence shows

Despite the plausible biological mechanisms for pathogen transfer, quantifying the direct contribution of insects to HAI rates is challenging. Much of the available literature consists of studies identifying pathogens on insects captured within hospitals, rather than epidemiological studies linking insect presence to patient infection. For example, studies have isolated multidrug-resistant organisms (MDROs), including methicillin-resistant Staphylococcus aureus (MRSA) and vancomycin-resistant enterococci (VRE), from cockroaches and flies collected in hospital wards. One study identified 14 different bacterial species, including potential pathogens, on flies captured in a hospital environment.1 Another investigation found that over 50% of cockroaches sampled in a hospital carried at least one pathogenic bacterium.1 While these findings demonstrate the potential for insects to harbour and transport pathogens, they do not definitively prove that these insects are the direct cause of patient infections. The chain of transmission from insect to patient, resulting in clinical infection, is difficult to isolate from other, more common routes of HAI transmission, such as direct contact, contaminated hands of healthcare workers, or contaminated medical devices.1

The risk posed by insects is often considered an indirect one, exacerbating existing infection control challenges rather than being a primary driver of outbreaks. For instance, an insect landing on a sterile field or an open wound could introduce pathogens, but the frequency and clinical impact of such events are not well-documented. Environmental factors, such as poor waste management, structural deficiencies allowing insect entry, and inadequate cleaning protocols, contribute significantly to insect proliferation. Effective pest management programmes, therefore, are considered an integral part of comprehensive infection control strategies. These programmes typically involve a multi-faceted approach, including regular inspections, sealing entry points, proper waste disposal, and targeted insecticide application when necessary. The aim is to minimise insect populations to reduce the theoretical risk of pathogen transmission, even if the exact quantification of that risk remains elusive.1

The absence of definitive, large-scale epidemiological studies directly linking insect presence to increased HAI rates does not negate the need for stringent pest control. The psychological impact on patients and staff, the potential for allergic reactions, and the general perception of poor hygiene are sufficient reasons to maintain an insect-free environment. Furthermore, the precautionary principle dictates that where a plausible risk exists, even if unquantified, measures should be taken to mitigate it. Therefore, current guidelines for infection prevention and control in healthcare facilities universally recommend robust pest management as a component of environmental hygiene. These recommendations are based on the understanding of insect biology, their known capacity to carry pathogens in other settings, and the imperative to maintain a clean and safe patient care environment. The focus remains on prevention and rapid response to any sightings, ensuring that potential vectors are removed promptly and their entry points sealed.1

> **CLINICAL IMPLICATIONS**
>
> The persistent presence of insects in healthcare facilities, while undeniably unsettling for patients and staff, presents a nuanced challenge for infection control practitioners. The current evidence base, largely observational, confirms that insects can carry a wide array of pathogens, including MDROs. However, the direct epidemiological link to patient infections remains largely unquantified. This gap means that while we can demonstrate the potential for transmission, attributing specific HAI rates to insect vectors is difficult. Clinicians should therefore continue to prioritise established infection control measures, such as hand hygiene,

environmental cleaning, and sterile technique, which have a more robust evidence base for preventing HAIs. For hospital administrators and facilities management, the implication is clear: pest control is not merely an aesthetic concern but an integral part of patient safety. Investment in structural maintenance, effective waste management, and proactive pest monitoring programmes is essential. Relying solely on reactive measures after an infestation is identified is insufficient. The industry providing pest control services to healthcare must also evolve, offering solutions that are both effective against common hospital pests and safe for use in patient care areas, minimising chemical exposure risks. This requires a collaborative approach between infection control teams and pest management professionals to tailor strategies to the specific vulnerabilities of each facility.

Ultimately, while the “ick factor” of insects in a hospital is high, the immediate clinical action remains consistent with existing best practices. The absence of a definitive, quantified risk should not lead to complacency. Instead, it underscores the importance of a comprehensive, multi-layered approach to infection prevention, where environmental hygiene, including rigorous pest management, supports the broader goal of patient safety. Further research, perhaps through advanced molecular epidemiology, could help to more precisely delineate the role of insects in HAI transmission, providing a clearer evidence base for targeted interventions.

EDITORIAL & AI STANDARDS

AI tools are used solely to structure and summarise evidence from peer-reviewed primary sources. No AI-generated conclusions appear in The Life Science Feed without editor verification against the primary source.

REFERENCES

1. 1. Stroever S, Patel R, Meeks B, Schouten N, Stuart D, Hanrahan J, Rumbaugh K, Diggle SP. From infestation to infection: a systematic review of arthropod-mediated microbial transmission in hospitals. Antimicrob Steward Healthc Epidemiol. 2026;6(1):e16. doi:10.1017/ash.2025.10266
2. 2. Patel R, Meeks B, Schouten N, et al. Assessment of microbial transmission by insect vectors in healthcare settings: a systematic review. Antimicrob Steward Healthc Epidemiol. 2025;5(Suppl 2):s118. doi:10.1017/ash.2025.361
3. 3. Crespo A, de Armas Y, Capó V, et al. Pathogens of medical importance identified in hospital-collected cockroaches: a systematic review. Microorganisms. 2025;13(2):337. doi:10.3390/microorganisms13020337
4. 4. Hanrahan J, Schouten N, Fyffe SH, Jencson A, Stroever S. Invasion of superbugs: cockroach-driven outbreak of multidrug-resistant Enterobacter in an ICU. Antimicrob Steward Healthc Epidemiol. 2024;4(1):e155. doi:10.1017/ash.2024.425
5. 5. Donkor ES. Nosocomial pathogens: an in-depth analysis of the vectorial potential of cockroaches. Trop Med Infect Dis. 2019;4(1):14. doi:10.3390/tropicalmed4010014

LICENCE & RIGHTS

MEDICAL DISCLAIMER

This content is intended for healthcare professionals only and does not constitute medical advice. Clinical decisions must be made by qualified practitioners based on individual patient circumstances.