Commentary

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The Role of Hospital Hygiene in Preventing Healthcare-associated Infections

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Introduction

Healthcare-associated Infections (HAIs), also referred to as nosocomial infections, represent one of the most pressing challenges in modern healthcare systems. They occur in patients during the course of receiving treatment for other conditions and are not present or incubating at the time of admission. HAIs significantly increase morbidity, mortality, and healthcare costs, making them a global public health priority. The World Health Organization estimates that hundreds of millions of patients worldwide are affected by HAIs every year, with particularly high prevalence in intensive care units and surgical wards. Among the most common HAIs are bloodstream infections, urinary tract infections, ventilator-associated pneumonia, and surgical site infections. These conditions are often caused by pathogens such as *Staphylococcus aureus*, *Escherichia coli*, *Klebsiella pneumoniae*, *Pseudomonas aeruginosa* and *Clostridioides difficile*, many of which display multidrug resistance. The alarming rise of antimicrobial resistance amplifies the severity of HAIs, as infections that were once easily treatable now result in prolonged hospital stays, increased medical costs, and higher mortality rates. Against this backdrop, hospital hygiene emerges as one of the most crucial, cost-effective, and universally applicable strategies to prevent HAIs [1].

Description

The foundation of hospital hygiene rests upon the principle of breaking the chain of infection. Infections spread through various routes-direct contacts, indirect contact via contaminated surfaces or equipment, droplet transmission, airborne dissemination, or through invasive devices like catheters and ventilators. Hospital environments, due to their density of vulnerable patients, high use of invasive procedures, and frequent exposure to pathogens, are particularly conducive to infection transmission. Poor hygiene practices, inadequate cleaning, and lapses in sterilization create reservoirs where pathogens thrive and spread. Therefore, robust hygiene measures aim to eliminate or reduce these reservoirs, interrupt transmission pathways, and bolster host defenses. The concept of Infection Prevention and Control (IPC), endorsed globally, situates hospital hygiene at the heart of healthcare delivery. Effective IPC not only protects patients but also safeguards healthcare workers, visitors, and the broader community from infectious threats [2].

Hand hygiene is universally recognized as the single most important hospital hygiene practice in preventing HAIs. The hands of healthcare workers act as vectors for pathogen transmission between patients, surfaces, and medical equipment. Compliance with hand hygiene protocols-such as washing with soap and water or using alcohol-based hand sanitizers before and after patient contact, after exposure to bodily fluids, and after contact with patient surroundings-dramatically reduces infection rates. Despite strong evidence and clear guidelines, hand hygiene compliance remains suboptimal worldwide, often ranging between 30% and 70%. Barriers include time constraints, skin irritation, forgetfulness, and lack of resources. Successful strategies to improve compliance involve multimodal approaches combining education, reminders in the workplace, leadership support, availability of hand hygiene supplies, and continuous monitoring with feedback [3].

Environmental hygiene, encompassing cleaning and disinfection of surfaces, equipment, and hospital wards, is another pillar of infection prevention. Pathogens can survive for extended periods on surfaces such as bed rails, doorknobs, medical instruments, and ventilator circuits, becoming sources of cross-contamination. High-touch surfaces in particular require frequent disinfection with appropriate agents. Cleaning protocols should specify not only the type of disinfectant but also the frequency and method of application. Advances in cleaning technologies, such as ultraviolet light disinfection and hydrogen peroxide vapor systems, have shown promise in reducing microbial contamination in hospital environments. However, the efficacy of such technologies depends on rigorous implementation, staff training, and integration with standard cleaning practices [4].

Sterilization and disinfection of medical devices represent a critical aspect of hospital hygiene, especially in preventing device-associated infections. Instruments that enter sterile body sites, such as surgical tools and catheters, must undergo sterilization processes-such as autoclaving, ethylene oxide gas sterilization, or plasma sterilization-to ensure complete eradication of pathogens. Central sterile supply departments play a vital role in ensuring that medical instruments are appropriately cleaned, packaged and sterilized before use. Regular auditing, equipment maintenance, and staff competency training are essential to minimize risks associated with contaminated medical devices [5].

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Conclusion

Hospital hygiene is a cornerstone of patient safety and a frontline defense against healthcare-associated infections. Its scope spans from hand hygiene and environmental cleaning to sterilization, device care, air and water quality management, and antimicrobial stewardship. Systematic adherence to hygiene protocols prevents the spread of pathogens, reduces morbidity and mortality, and curtails healthcare costs. Importantly, hospital hygiene is not just a technical or procedural issue but a cultural one, requiring sustained commitment from healthcare workers, hospital leadership, and policymakers. In an era of rising antimicrobial resistance and global health threats, investing in and prioritizing hospital hygiene is not optional—it is a moral and professional imperative. By fostering a culture of cleanliness, vigilance, and accountability, hospitals can transform themselves into safer environments where patients can heal without the added risk of preventable infections.

Acknowledgement

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Conflict of Interest

None.

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