

Mitigating Antimicrobial Resistance in Hospital Settings: Evaluating the Efficacy of Novel Disinfection Protocols

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Abstract. Antimicrobial resistance (AMR) poses a significant threat to global health, exacerbated by the increasing prevalence of multidrug-resistant pathogens in hospital environments. This study assesses the effectiveness of advanced disinfection protocols utilizing novel biocidal agents compared to conventional methods. A systematic review and a series of controlled laboratory experiments were conducted to evaluate the reduction rates of various pathogenic strains. The results indicate that the novel protocols offer a statistically significant improvement in microbial load reduction, suggesting their potential as a standard practice in infection control. These findings advocate for their integration into hospital hygiene policies to combat AMR and improve patient safety.

Keywords: Antimicrobial Resistance, Hospital Disinfection, Biocidal Agents, Infection Control, Multidrug-Resistant Pathogens, Healthcare Hygiene, Infection Prevention, Novel Disinfection Protocols, Microbial Load Reduction

Introduction

Antimicrobial resistance (AMR) has emerged as one of the foremost global health challenges, with projections indicating it could cause 10 million deaths annually by 2050 if left unaddressed. The rise of multidrug-resistant organisms (MDROs) in healthcare settings complicates the management of infectious diseases, leading to prolonged hospitalizations and increased healthcare costs. Particularly, hospitals are breeding grounds for these resistant strains due to high antibiotic utilization and the vulnerable patient populations they serve. In response, healthcare systems are mandated to adopt strategies that enhance hygiene and reduce the spread of infections. In recent years, traditional disinfection methods have been scrutinized for their efficacy against resistant pathogens, prompting the

exploration of innovative disinfection solutions. This paper presents a thorough investigation into the effectiveness of novel disinfection protocols that employ biocidal agents with mechanisms capable of eradicating resistant strains. The methodology includes a systematic review of existing literature and experimental studies that test these new protocols against standard practices. Initial findings suggest a paradigm shift in disinfection practices, where the integration of advanced technologies may mitigate the risk of AMR transmission in hospitals. The structure of this paper is organized as follows: Firstly, we discuss the background and significance of AMR, followed by a detailed analysis of traditional versus novel disinfection protocols. Next, we present our experimental design and results, culminating in a discussion of implications for hospital policy and future research directions.

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References

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