

Elevating Decontamination Practices: **A Scientific Imperative in Combating Antimicrobial Resistance**

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Antimicrobial resistance (AMR) has emerged as a critical global health threat, with healthcare-associated infections (HAIs) significantly contributing to this crisis. In Europe, approximately 4 million patients acquire an HAI annually, leading to an estimated 37,000 deaths each year¹. These infections not only result in substantial morbidity and mortality but also impose considerable economic burdens, including prolonged hospital stays and increased healthcare costs^{1,2}.

A significant proportion of HAIs are linked to surgical procedures, where pathogens infiltrate through incisions, leading to surgical site infections (SSIs). The incidence of SSIs can be as high as 20%, depending on the type of surgery and other factors³. Common causative agents include *Staphylococcus aureus*, coagulase-negative staphylococci, *Enterococcus* species, and *Escherichia coli*. Notably, *Staphylococcus aureus* accounts for approximately 25.8% of SSIs, with methicillin-resistant *Staphylococcus aureus* (MRSA) isolated in about 4.5% of cases.

The increasing prevalence of multidrug-resistant organisms (MDROs) in HAIs amplifies the urgency of effective infection prevention and control measures. Central Sterile Services Departments (CSSD) and Endoscopy units are pivotal in this endeavor, as they are responsible for the decontamination and sterilization of medical instruments. However, inadequate decontamination processes can transform these units into reservoirs for infection transmission, exacerbating the spread of MDROs⁴.

For too long, decontamination has been viewed primarily as a process-driven function, heavily monitored and managed, rather than a science-driven practice requiring expertise. The emphasis has often been placed on compliance with protocols rather than fostering a deeper understanding of microbiology and infection control among those working in CSSD. This needs to change. The future of infection prevention lies in embedding a scientific culture into decontamination practices—one that prioritizes education, critical thinking, and evidence-based approaches rather than rigid managerial oversight.

Traditionally, CSSD and decontamination units have been managed by personnel with limited formal education in microbiology and infection control. Although not entirely, this oversight must be rectified to address the complexities of AMR effectively. Elevating decontamination practices to a recognized scientific discipline is imperative. This involves implementing structured education programs that encompass microbiology, infection prevention, and the latest decontamination technologies². By equipping CSSD and Endoscopy personnel with specialized knowledge, we can enhance their role in preventing the spread of MDROs.

Furthermore, fostering collaboration between decontamination teams, infection prevention and control specialists, and microbiologists is essential. Such interdisciplinary partnerships can lead to the development of evidence-based protocols that effectively reduce the risk of infection transmission through medical instruments⁴. Rather than treating CSSD as a service that merely supports surgical and medical teams, it must be acknowledged as an integral part of patient safety, working alongside clinicians and microbiologists to ensure infection control is optimized at every stage.

Investing in advanced sterilization technologies and adhering to standardized global practices are also crucial steps toward strengthening our defenses against AMR⁵. However, technology alone will not solve the problem. Without the scientific knowledge to interpret data, adapt decontamination methods, and critically assess risks, even the most advanced sterilization technologies may fail to prevent HAIs⁵. A workforce that understands the science behind decontamination will be far more effective than one simply following step-by-step procedures under constant supervision.

Recognizing decontamination as a scientific discipline is not merely an option but a necessity in our fight against AMR. By enhancing education, fostering interdisciplinary collaboration, and embedding scientific principles into daily practice, we can mitigate the silent pandemic of antimicrobial resistance and ensure the safety and well-being of patients across healthcare settings. It is time to shift from a culture of management and compliance to one of scientific inquiry and expertise. Only by doing so can we hope to curb the relentless threat of hospital-acquired infections and safeguard the future of modern medicine.

References

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