



## AN OVERVIEW ROLES OF HEALTH CARE PROFESSIONALS IN HOSPITAL ACQUIRED INFECTION PREVENTION

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### Abstract:

Hospital-acquired infections (HAIs) are responsible for prolonging hospital stays, increasing death rates, and raising healthcare expenses. The prevention and management of HAIs is a crucial issue in public health. This review aims to examine the role of healthcare providers in preventing these infections. The variations in the execution of infection control standard precautions across different nations can be attributed to disparities in education, training, organizational culture, policies, the availability of infection control guidelines, and the monitoring of their compliance.

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**DOI:** 10.53555/ecb/2022.11.8.62

**Introduction:**

Healthcare-associated infections (HAIs) refer to infections that people get while seeking medical treatment for unrelated conditions at hospitals, acute care clinics, community health centers, or care homes. The intensive care unit is a common setting for a significant number of healthcare-associated infections (HAIs), with many of these infections being caused by the use of invasive medical equipment, namely central lines, urine catheters, and ventilators [1]. The precise worldwide impact of healthcare-associated infections (HAIs) remains uncertain due to the absence of dependable statistics. Nevertheless, the combined prevalence of healthcare-associated infections (HAIs) has been documented at 7.6% in high-income nations and 10.1% in low-income and middle-income nations. Hospital-acquired infections (HAIs) pose challenges for both patients and healthcare workers due to their association with extended hospital stays, heightened microbial resistance to antimicrobial drugs, and added financial strain on the healthcare system and patients [2].

Adhering to infection control recommendations can mitigate the risk of healthcare-associated infections (HAIs). Hand hygiene, the utilization of sterile and properly working equipment, and the implementation of infection prevention and control programs and teams are highly successful in preventing a significant number of healthcare-associated infections (HAIs) [3]. According to the World Health Organization (WHO), it is recommended to have a specialized and well-trained staff at every acute healthcare institution in order to avoid Healthcare-Associated Infections (HAIs) [4]. The implementation of infection control in hospitals is carried out by the infection control team (ICT). Information and Communication Technologies (ICTs) were first developed in the United Kingdom during the 1950s and have since been adopted in several nations [5]. Originally, medical professionals such as physicians, nurses, epidemiologists, and microbiologists received specialized training to become infection control experts and were then assigned to the ICT (Infection Control Team). Subsequently, infection control experts were designated with many alternative titles, including infection control professionals, infection control practitioners, or infection preventionists. Infection control nurses (ICNs) constitute the bulk of infection control experts. Several nations adhere to a guideline of having one Infection Control Nurse (ICN) for every 250 hospital beds and one epidemiologist or medical microbiology for every

1000 hospital beds [5]. Hospital epidemiologists are medical professionals, such as doctors or paediatricians, who have received specialized training in infection control [5].

**Review:**

The infection control link nurse (ICLN) system was initially implemented in the late 1980s to address several limitations. These included the clinical staff's limited engagement and excessive reliance on information and communication technology (ICT), the absence of a sense of ownership of infection control in clinical wards, and the difficulty in recruiting qualified and experienced infection control professionals [6]. The ICT system has developed to incorporate more positions, namely ICLNs and infection control champions (ICCs). ICLNs and ICCs are ward-based personnel who operate under the guidance of ICNs and serve as a liaison between their respective clinical wards and the ICT [7].

The responsibilities of the ICLNs (Infection Control Link Nurses) and ICCs (Infection Control Coordinators) encompass several key tasks. These include serving as exemplars of infection control best practices for each ward, fostering communication between wards and the ICT (Infection Control Team), serving as a local source of expertise on infection control matters for the ward, promoting and overseeing infection control practices at the ward level, aiding in the prompt identification of outbreaks, delivering pertinent infection control training, conducting infection control audits, and engaging in research [6,7].

The implementation of team-based healthcare and practices enhances patient outcomes, service efficiency, and service quality, while simultaneously decreasing healthcare expenses and boosting work satisfaction. Prior systematic studies have indicated that educational and packaged behavioral treatments are efficacious in avoiding healthcare-associated infections (HAIs) [8]. A scoping assessment was conducted to examine the working practices of ICTs. However, the review did not provide any information about their efficacy or cost-effectiveness [6]. A different scoping assessment documented the existence of the ICLN system, although there is insufficient data about its effectiveness [9]. Furthermore, a comprehensive analysis documented the factors that support and hinder the use of the ICLN system in acute healthcare environments [10].

Hospital-acquired infections, or healthcare-associated infections (HAI), are illnesses that are

contracted in a hospital setting and are usually not present or in the early stages of development at the time of admission. These infections are typically contracted upon hospitalization and become evident 48 hours after being admitted to the hospital. The National Healthcare Safety Network (NHSN) of the Center for Disease Control and Prevention (CDC) regularly monitors the diseases. The user's text is empty. The purpose of this monitoring is to mitigate the occurrence of Healthcare-Associated Infections (HAI) and enhance patient safety. Hospital-acquired infections (HAIs) encompass several types of infections, such as central line-associated bloodstream infections (CLABSI), catheter-associated urinary tract infections (CAUTI), surgical site infections (SSI), Hospital-acquired Pneumonia (HAP), Ventilator-associated Pneumonia (VAP), and Clostridium difficile infections (CDI) [3].

Hospital-acquired infections (HCAIs) pose a substantial worldwide public health challenge, prompting concerns from various healthcare stakeholders, including healthcare providers, patients, and the general public. Their influence has significantly amplified due to the emergence of multidrug-resistant pathogenic bacteria [6,10]. Presently, the majority of existing antimicrobials exhibit resistance, while only a limited number of antimicrobials are being developed for extensive utilization. Of all these disease-causing microorganisms, *Klebsiella pneumoniae* is the most prevalent and problematic pathogen, particularly in intensive care unit (ICU) environments. Preventing and controlling healthcare-associated infections (HCAIs) is a complex task that necessitates a comprehensive and multifaceted strategy and techniques to tackle this important public health issue [10].

In recent decades, hospitals have prioritized addressing hospital-acquired illnesses. Multiple hospitals have used infection tracking and surveillance systems, in addition to strong preventative initiatives, to decrease the incidence of hospital-acquired infections [11]. Hospital-acquired illnesses not only affect individual patients, but also have implications for the broader population due to their association with multidrug-resistant diseases. It is crucial to identify patients who have risk factors for hospital-acquired infections and multidrug-resistant illnesses in order to effectively prevent and reduce the occurrence of these diseases [11].

The criteria of Pneumonia have been revised by the Infectious Disease Society of America (IDSA) and

the American Thoracic Society (ATS) to enhance the identification of individuals who are susceptible to multidrug-resistant (MDR) bacteria. The purpose of this is to prevent the excessive utilization of antibiotics. The term Healthcare-acquired Pneumonia (HCAP), once in common usage, has become outdated. Hospital-acquired Pneumonia (HAP) has superseded HCAP as the designated term. According to the IDSA recommendations, Hospital-acquired Pneumonia is characterized as "pneumonia that develops 48 hours or more after being admitted to the hospital and was not in the early stages of development at the time of admission". As to the Infectious Diseases Society of America (IDSA), Ventilator-associated pneumonia (VAP) is specifically characterized as "pneumonia that occurs after 48 to 72 hours following the insertion of an endotracheal tube". Both Hospital-Acquired Pneumonia (HAP) and Ventilator-Associated Pneumonia (VAP) are linked to worse outcomes and substantial morbidity and death on a global scale [12].

The likelihood of acquiring diseases at a hospital is determined by the infection control measures used at the institution, the patient's immune system, and the presence of different disease-causing agents in the community. The risk factors for healthcare-associated infections (HAI) encompass immunosuppression, advanced age, prolonged hospitalization, many underlying comorbidities, frequent healthcare facility visits, mechanical ventilatory support, recent invasive operations, presence of indwelling devices, and stay in an intensive care unit (ICU) [13]. Receiving intravenous antibiotics in the past 90 days is a significant risk factor for acquiring resistance to various medicines. Although hospitalizations are crucial for treating acute diseases, they also increase the vulnerability of vulnerable individuals to various nosocomial infections, which are often resistant to antimicrobial treatments. These germs might be obtained via other patients, hospital personnel, or the hospital premises. The risk is elevated among patients in the intensive care unit (ICU). A point prevalence research, encompassing 231,459 patients from 947 hospitals, determined that around 19.5% of patients in the intensive care unit (ICU) experienced at least one healthcare-associated infection (HAI) [13].

*Clostridium difficile* is the causative agent of *Clostridium difficile* colitis (CDI). The typical organisms associated with CLABSI include *Candida* spp in adult ICU settings, *Enterobacteriaceae* in adult wards, pediatric ICU and wards, as well as cancer wards, and staph

aureus. The typical microorganisms responsible for causing CAUTI include Enterococcus, Staphylococcus aureus, Pseudomonas, Proteus, Klebsiella, and Candida. As per the National Healthcare Safety Network, the primary organisms responsible for surgical site infections (SSI) include staph aureus, coagulase-negative staphylococcus, Enterococcus, E Coli, Pseudomonas aeruginosa, Enterobacter, and Klebsiella pneumoniae, listed in descending order of occurrence. The predominant bacteria responsible for Hospital-Acquired Pneumonia (HAP) and Ventilator-Associated Pneumonia (VAP) are Staphylococcus aureus and Pseudomonas aeruginosa. However, Escherichia coli and Klebsiella pneumoniae are more frequently observed in pediatric populations [14].

#### Conclusion:

Efficient measures are necessary to tackle the global problem of healthcare-associated infections and enhance patient safety. The primary techniques for reducing healthcare-associated infections (HAIs) include practicing proper hand hygiene and using antimicrobials judiciously. Practicing good hand hygiene is the most effective way to prevent the spread of antibiotic resistance and reduce healthcare-associated infections (HAIs). Practicing proper hand hygiene can effectively reduce the occurrence of healthcare-associated infections (HAIs) as healthcare workers' hands are the primary means by which germs are transmitted between patients and within the hospital setting. Existing data emphasizes that the use of multimodal intervention techniques results in enhanced hand hygiene and a decrease in healthcare-associated infections (HAIs). To overcome infrastructural hurdles and enhance knowledge progress, the implementation of alcohol-based hand massages and ongoing instructional initiatives are crucial. Antimicrobial stewardship is crucial for optimizing the utilization of antimicrobials in order to minimize the emergence of resistance and enhance patient outcomes.

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