



AN OVERVIEW OF CRITICALLY IMPORTANT CONCEPTS IN INFECTION CONTROLS, ROLES OF PHYSICIANS-NURSING AND MEDICAL LABORATORY; REVIEW

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Abstract:

Infection is a significant concern in healthcare facilities globally. Healthcare personnel, such as medical laboratory technicians and nurses, are susceptible to infection due to their proximity to diseased patients. This analysis was conducted to assess the involvement of physicians, nurses, and laboratory teams in the implementation of Infection Prevention Control (IPC) procedures among healthcare professionals (HCPs). The perspective changed from considering most Healthcare-Associated Infections (HAIs) as an inevitable expense to recognizing that the majority of them may be prevented. Hospital programs moved focus from infection management to infection prevention, necessitating prompt identification of infections, timely analysis, and active involvement in implementing treatments to reduce infections. Strategies to maintain the strong awareness, favorable attitudes, and effective Infection Prevention and Control practices by addressing the factors linked to these variables as discovered in this study should be developed and put into action.

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Introduction:

Preventing healthcare-associated infections (HAIs) is crucial for ensuring the safety of patients and healthcare workers (HCWs) and should be a primary focus for healthcare systems and organizations. The frequency of Healthcare-Associated Infections (HAIs) among hospitalized patients ranges from 5 to 15%, and it can impact 9–37% of individuals admitted to critical care units (ICUs). At any given moment in the United States, 1 in 25 hospitalized patients are impacted by a Healthcare-Associated Infection (HAI).

Healthcare-associated infections (HAIs) can lead to diminished quality of life and decreased life expectancy for the affected individual, in addition to generating significant long-term expenses. The probability of Healthcare-Associated Infections (HAIs) after a needle-stick injury from an infected source patient was 0.3% for HIV, 3% for hepatitis C, and 6–30% for hepatitis B. HAIs have been linked to severe mental health conditions such as anxiety, depression, adjustment disorder, panic attacks, and post-traumatic stress disorder [3]. HCW's failure to comply with Infection Prevention and Control protocols. The global burden of healthcare-associated infections (HAIs) seems to be significant and often underestimated. Methods for evaluating the extent and characteristics of the issue are available but require simplification and customization to be cost-effective in environments with little resources and data. Preventive measures, including hand cleanliness, are usually easy to put into practice. It is crucial for IPC to be elevated in importance within national health programs, particularly in nations with limited resources.

Infection prevention and control (IPC) is a crucial aspect of all health systems that impacts the health and safety of both healthcare recipients and providers. Healthcare-associated infections (HAIs) are prevalent adverse events in healthcare, posing a significant public health issue due to both their consistent presence and occasional outbreaks. In 2011, the World Health Organization (WHO) said that around 7% of patients in industrialized nations and 15% in low- and middle-income countries (LMICs) experience at least one Healthcare-Associated Infection (HAI) at any one moment, with an estimated fatality rate of 10%. In low- and middle-income countries (LMICs), the prevalence of healthcare-associated infections (HAI) is considerably greater, particularly among vulnerable groups such patients in neonatal and critical care units. The occurrence of HAI in these units is two to 20 times more frequent compared to high-income nations, especially for infections related to medical devices.

Review:

The presence and negative consequences of healthcare-associated infections (HAIs) have been well acknowledged in literature for many years. HAIs are increasing rapidly. Originally, HAIs were infections linked to hospital admission (formerly known as nosocomial infections), but now the term includes infections acquired in various healthcare settings such as long-term care, home care, and ambulatory care. These unexpected infections arise during medical treatment and lead to severe patient illnesses and deaths; lengthen hospital stays; and require extra diagnostic and therapeutic procedures, resulting in additional costs on top of the ones already associated with the patient's initial disease. Healthcare-associated infections (HAIs) are viewed as unfavorable results, and since some may be avoided, they serve as a measure of the standard of patient care, an adverse incident, and a patient safety concern.

Research from 1991 shows that the most common adverse events experienced by hospitalized patients are adverse medication events, nosocomial infections, and surgical complications. The Institute of Medicine found that adverse events impact over 2 million people annually in the United States, leading to 90,000 deaths and an estimated \$4.5–5.7 billion per year in extra expenses for patient care. Recent developments in medical management have led to a movement of medical care and services from inpatient to outpatient settings, resulting in a decrease in hospital admissions. The average length of inpatient stays has reduced but the occurrence of Healthcare-Associated Infections (HAIs) has risen. The actual occurrence of Healthcare-Associated Infections (HAIs) is probably lower than reported since patients may leave the hospital before showing signs of an illness caused by a bacterium acquired during their stay. Between 12% and 84% of surgical site infections are identified after patients leave the hospital, with the majority becoming apparent within 21 days post-surgery. Patients who have been discharged from the hospital may seek care in a nonacute care facility for follow-up or regular care. The reporting systems at non-acute care institutions are not as interconnected as those in acute care facilities, and the mechanisms for reporting are not directly connected to the acute care environment to record the probable source of some illnesses.

HAI surveillance has been monitoring infection patterns in health care institutions since the early 1980s. National infection control surveillance has shown a decline in specific health care-associated infections in certain intensive care units over the

past decade due to the implementation of evidence-based strategies. However, there has been a concerning rise in microorganisms that are resistant to antimicrobial agents. Changing trends in healthcare can be influenced by factors like rising inpatient acuity of illness, insufficient nurse-patient staffing ratios, lack of system resources, and other demands that have made it difficult for healthcare providers to consistently implement evidence-based recommendations to enhance prevention efforts. Despite the challenges faced by health care professionals and resources, it is crucial to continue striving to decrease avoidable Healthcare-Associated Infections (HAIs) in order to enhance patient safety.

Increasing public pressure on State lawmakers is prompting health care institutions to intensify their efforts in preventing Healthcare-Associated Infections (HAIs) due to the need for laws mandating hospitals to reveal their particular rates of sickness and death. The Institute of Medicine report highlighted HAIs as a patient safety issue and proposed implementing mandatory reporting of adverse health events to enhance public oversight and increase accountability in healthcare facilities, aiming to enhance medical care quality and decrease infection rates.³ Since 2002, Florida, Illinois, Missouri, and Pennsylvania have passed laws requiring health care companies to publicly reveal Healthcare-Associated Infections (HAIs). In 2006, the Association for Professionals in Infection Control and Epidemiology (APIC) said that 14 states require public reporting, while 27 states are contemplating other relevant laws. Currently, the Federal sector has not controlled participation in public reporting. Hospital reporting is meant for the State health agency to create confidential reports for each facility's internal quality improvement. Another use for using public reporting might be to compare rates of Healthcare-Associated Infections (HAI) and resulting morbidity and mortality outcomes across various institutions. Currently, there is a dearth of scientifically established strategies for altering the risks of healthcare-associated infections based on various factors such as variances in sickness severity among different patient populations. Furthermore, there is a dearth of evidence about the effectiveness of public reporting systems in reducing HAIs.

Proposed measures for patient safety procedures aim to help provide relevant data on processes and outcomes. Examining both process and outcome indicators and evaluating their relationship is an effective method to demonstrate that effective procedures result in positive healthcare outcomes. Process measurements should be representative of

typical procedures, be applicable across different healthcare environments, and have suitable criteria for inclusion and exclusion. Examples include of techniques for inserting central intravenous catheters, timing of antibiotic prophylaxis in surgical patients, and rates of influenza vaccination among healthcare staff and patients. Outcome measurements should be selected according to the occurrence rate, severity, and avoidability of the outcome events. Examples consist of infection rates associated to intravascular catheters and surgical-site infections in certain surgeries. While infrequent, these infections have high severity and are linked to significant morbidity, death, and increased healthcare expenses. Evidence-based preventative methods are accessible.

Internal risk factors make patients more likely to get Healthcare-Associated Infections (HAIs). Vulnerable people who are immunocompromised due to factors such as age (neonate, elderly), underlying disorders, severity of sickness, immunosuppressive drugs, or medical/surgical therapies have an increased risk of infection. Patients with impaired cellular immune function, phagocytosis, or humoral immune response are more susceptible to infections and have less ability to fight them off. Individuals with primary immunodeficiency are prone to experiencing numerous or severe illnesses, including recurrent pneumonia, due to their weakened immune system. Secondary immunodeficiencies, such as those caused by chemotherapy, corticosteroids, diabetes, and leukemia, make patients more vulnerable to infections from common, less aggressive bacteria, opportunistic fungi, and viruses. Due to the seriousness of a patient's sickness and other risk factors, it is not surprising that ICU patients have the highest infection rates. Healthcare-associated infection rates in adult and pediatric intensive care units are almost three times greater than in other areas of hospitals [12].

Extrinsic risk factors including surgical operations, invasive interventions, implanted foreign bodies, organ transplants, immunosuppressive drugs, and staff exposures. One study paper stated that a minimum of 90 percent of illnesses were linked to intrusive devices. Invasive medical gadgets circumvent the skin or mucous membranes' usual defensive mechanisms, creating environments where bacteria can thrive, protected from the patient's immune system. These devices can serve as a gateway for microbes to enter the body and can also aid in the spread of infections across different parts of the patient's body, between healthcare workers and patients, or between patients and healthcare workers.

Conclusion:

Infection prevention strategies can be categorized as vertical or horizontal. Vertical treatments focus on minimizing risk from a specific infection and frequently include microbiological testing. The significance of environmental hygiene has substantially increased as the number of immunosuppressed patients in hospitals has risen. Technical concerns related to air handling, building, demolition, water supply, pest control, and medical waste management may necessitate cooperation with engineers, architects, and other nonmedical specialists, such as external consultants. The guidelines for acute health care facilities for infection prevention and control (IPC) are applicable to any facility providing health care services as a strategy to prevent healthcare-associated infections (HAI). Hence, these principles should be taken into account with modifications by community, primary care, and long-term care facilities as they create and assess their Infection Prevention and Control (IPC) programs.

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