

INTRO

INTRODUCTION

The Ebola outbreak in 2014 was the largest in history, affecting multiple nations and continuing to spread despite worldwide emergency responses. This epidemic garnered much public attention, and rightly so. However, many infection control concerns do not make the news but still affect millions of people in developed and developing nations alike. Chief among these are health care–associated infections (HAIs).

Patients getting sick or sicker while in a health care setting may be ironic, but it is not new. More than 75,000 patients die every year from HAIs in the United States alone.¹ Although global statistics are not available, the World Health Organization (WHO) has estimated that hundreds of millions of patients around the world are affected by HAIs each year, and the burden of these infections is significantly higher in low- and middle-income nations.² In addition to the human cost, there are financial repercussions: In the United States, treating patients who acquire HAIs costs an estimated \$9.8 billion annually.³ Furthermore, the US Centers for Medicare & Medicaid Services (CMS) no longer reimburses for extra costs associated with certain types of HAIs acquired while the patient was receiving care, giving hospitals and other health care facilities even more incentive to implement prevention measures.⁴

Challenges of Infection Control

Every health care setting—not just hospitals—faces the challenge of keeping patients and staff free of infection, including HAIs. Those challenges differ, of course, by setting. Behavioral health care settings, for example, will not need to worry about negative-pressure isolation rooms, but they may need to address higher numbers of patients with certain infections, like tuberculosis or hepatitis C. Home care organizations will handle infection control differently because their staff members are providing care in patients' homes, where the organization has little control over the environment.

Many factors that contribute to HAI rates seem to be beyond the control of health care organizations, regardless of setting. Increasing numbers of patients have compromised immune systems. Emerging technology improves medical outcomes but introduces more complicated procedures that increase opportunities for the introduction of pathogens. Staff and supplies may be limited. Facilities and equipment become old or obsolete, requiring renovation or construction. New infectious organisms appear, and familiar ones gain resistance.

However overwhelming the obstacles may seem, many HAIs can be prevented, often with something as simple as hand hygiene. Despite the universal acknowledgment of the importance of hand hygiene by organizations such as The Joint Commission, Joint Commission International (JCI), WHO, and the US Centers for Disease Control and Prevention (CDC), compliance with established hand hygiene procedures is historically very low. This is the case even in developed countries such as the United States, which is estimated to have only around 50% compliance with hand hygiene guidelines.⁵

Infection Control and the Physical Environment

These challenges underscore the need for a strong, thorough, consistent infection control program in every type of health care setting. But operating in tandem is the need for an equally strong program to manage the physical environment. In the United States, this is commonly called the *environment of care*; internationally, it is known as the *health care environment* or *patient environment*. An organization's physical environment—the building, its furnishings, the equipment, and the utilities that support all of these—is inextricably linked to its ability to prevent and control infection. A well-designed, thoughtfully managed environment is the foundation upon which most infection control activities are built.

One example of the interconnectedness of infection control and the physical environment is the use of hand-washing sinks. As noted, hand hygiene is a critical infection control issue; to minimize infection risk, staff members must wash their hands. But if sinks are far from patient care areas, or are not cleaned regularly, or the water supply to the sinks is interrupted by a renovation project, then hand hygiene suffers and infection risk increases. In this example and myriad others, the physical environment has a direct impact on the ability of the organization to effectively manage its infection risks.

Leadership in Infection Control

Joint Commission and JCI standards and requirements recognize this connection. These standards require organizations to monitor, analyze, and improve conditions in the environment—including conditions affecting infection control. And to a much greater degree than ever before, the requirements compel organization leadership to assume responsibility for reducing the risk and transmission of HAIs, including environmental risks. These standards and requirements place accountability for the effectiveness of an organization's infection control program squarely with its leaders, who are responsible for ensuring adequate staff training in infection control, communicating and coordinating efforts with the health department and other community agencies, and allocating sufficient resources to support the program.

Of course, leadership in infection control relies significantly on the presence and effectiveness of an infection preventionist (or other infection control practitioner). This individual has the specialized education and training needed to manage the complex set of issues entailed by infection control. The importance of this role was demonstrated in a US study of hospitals in California, where researchers found that US health care organizations that employed a certified infection preventionist had significantly lower rates of MRSA (methicillin-resistant *Staphylococcus aureus*) bloodstream infections than those organizations without one.⁶

But the infection preventionist cannot do it alone. In some cases, such as most of these occurring in home care settings, there may not even be an infection preventionist on staff. These factors underscore the importance of making infection control an organizationwide effort. This can only work when leadership establishes and promotes a culture of safety. Staff need to feel comfortable questioning procedures and pointing out areas that

need improvement. Open communication should be encouraged among all levels. There can be no punitive atmosphere, explicit or implied. This is so important that the Joint Commission standards require organization leadership to create and maintain this atmosphere. Every employee of the organization must feel they are important to infection control—which, of course, they are.

Inside This New Edition

This new edition of *Infection Prevention and Control Issues in the Environment of Care* is designed to help infection preventionists (and other infection control practitioners) and physical environment professionals collaborate on infection control issues to develop an infection control program that will protect patients, staff, and visitors from the threat of infection. This edition explores various infection control risks, in the United States and abroad, that can be minimized or eliminated through proper management of the physical environment in the following areas:

- Hand hygiene and sharps management
- Construction
- Medical equipment
- Utility systems
- Environmental services
- Infectious materials and waste
- Emergency management

This book provides information about policies, procedures, and guidelines that can help organizations to manage and benchmark infection control efforts. Case studies profile plans or projects that have proven effective in other facilities. The book also lists online resources, provides examples of useful tools, presents pros and cons of various infection control approaches, shares tracer scenarios and offers general and specific recommendations for infection control.

How to Use This Book

All health care organizations and facilities are responsible for establishing preventive measures for eliminating and mitigating infection control risks in their own environment. Some risks are the same in all environments, geographic locations, and health care settings; others are particular to the individual facility. Some solutions or guidelines will be applicable to many countries, while others may be specific to the United States. Most organizations will find strategies and approaches described in this book that may be combined in useful ways,

including those developed by professional and regulatory organizations, as well as strategies devised through long-term experiences by organizations.

This book is intended for use by health care professionals around the world. Some situations and requirements are not universally applicable. Unless otherwise stated in the text, the concepts included in this book will be treated as applicable to all health care organizations. Users of this book are encouraged to consult the appropriate Joint Commission or JCI accreditation manual to determine specific requirements.

Following is a chapter-by-chapter description of the book's contents.

Chapter 1 — The Connection: Infection Control and the Physical Environment: This chapter discusses current standards from The Joint Commission and JCI that relate to infection control and the physical environment as well as regulations and guidelines from other organizations. It explores the components of a strong infection control program and plan and emphasizes the importance of collaboration between infection control and environmental professionals. It also describes the use of tracers and environmental tours, which serve as proactive risk assessment tools.

Chapter 2 — The Human Element: Staff and Infection Control Compliance: The importance of understanding human factors, human errors, and human nature in the working partnership between infection control and physical environment professionals is the focus of this chapter. Specifically, it covers staff performance in relation to the issues of hand hygiene and sharps management, as well as staff training and competency. The chapter also includes a comparison of the US CDC and WHO guidelines for hand hygiene in addition to descriptions of other guidelines for hand hygiene and sharps.

Chapter 3 — Construction Projects: Infection Control Considerations: This chapter focuses on infection control related to construction and renovation of health care facilities, including the infection control risk assessment, specific design elements that support infection control, maintaining air quality during construction, and the multidisciplinary approach to minimizing risk in all stages of building projects. Infection control that incorporates sustainable principles and practices and construction worker safety and education are among other topics covered.

Chapter 4 — Medical Equipment: Reprocessing for Infection

Control: Cleaning and decontamination, disinfection, and sterilization methods for varying types of medical/surgical items are the focus of this chapter. The role of central processing and biomedical engineering, including maintenance of sterilizer equipment, is also covered. A special section on reprocessing recommendations for endoscopes is included.

Chapter 5 — Utility Systems: Infection Control Concerns:

This chapter discusses the heart of the infection control and physical environment connection with issues such as air handling, ventilation, and water distribution systems. One of the most common waterborne pathogens, *Legionella*, is discussed at length. The chapter explores standards related to utility systems and their maintenance. In addition, this chapter gives information on sick building syndrome; pressure relationships and air change rates; the use of high-efficiency particulate air filters; and the latest recommendations regarding no-touch faucets and decorative water features (fountains).

Chapter 6 — Environmental Services and Medical Waste

Disposal: Infection Control Issues: The issues examined in this chapter relate to maintaining the physical environment and infection control based on guidelines developed by the US CDC and WHO. The first half of the chapter focuses on housekeeping activities such as cleaning and laundry. This includes a discussion of how various types of surfaces may harbor infectious particles. The second half of the chapter turns to the management of regulated medical waste, with special information on Ebola-contaminated waste.

Chapter 7 — Emergency Management: Infection Control for

Disasters: How infection control issues relate to all four phases of emergency management is the focus of this chapter. It discusses specifics of the emergency management plans, including surge capacity as well as infectious patient surges and preparing for infectious disease outbreaks. The use of isolation rooms, anterooms, and personal protective equipment (PPE) is explored, and the pros and cons of indoor and outdoor decontamination are weighed.

Chapter 8 — Performance Improvement: Measuring Infection Control in the Physical Environment:

This chapter focuses on performance improvement in the environmental aspects of infection control. It includes strategies for collecting and displaying data to measure improvements in the physical environment and infection control so that health care organizations can make and

sustain progress, no matter what the setting. As in other chapters, the role of a multidisciplinary team approach is stressed as well as the need for staff training and education.

Notes on Language

Infection control is a complex and critical matter in all health care settings. In the United States, The Joint Commission has the following accreditation programs:

- Ambulatory health care
- Behavioral health care
- Critical access hospital
- Home care
- Hospital
- Laboratory
- Nursing care centers
- Office-based surgery

Joint Commission International has the following accreditation programs:

- Ambulatory health care
- Clinical laboratory
- Home care
- Hospitals (including academic medical centers)
- Long term care
- Medical transport organizations
- Primary care centers

The term *health care organization* is used to recognize and include all these organizations.

To help make this book accessible and relevant to organizations around the world, an effort has been made to use inclusive language while still distinguishing between Joint Commission and JCI terminology. The term *physical environment* is used as a global term to describe what is known in the United States as the *environment of care* and internationally as *patient care environment*. When specific US and international standards are referenced, they will be referred to using appropriate terms and abbreviations; for example, Infection Prevention and Control (IC), Environment of Care (EC), and Emergency Management (EM) for standards in the Joint Commission manuals, and in JCI manuals, Prevention and Control of Infections (PCI) and Facility Management and Safety (FMS).

Throughout the book, information not explicitly stated as requirements of The Joint Commission or JCI standards should be considered recommendations.

References

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About This Revised Third Edition

The revision reflects the adoption of the 2012 *Life Safety Code*®* by the US Centers for Medicare and Medicaid Services and the subsequent changes to The Joint Commission's domestic Life Safety standards, effective November 2016.

This revised edition is current with Joint Commission International (JCI) standards in effect as of February 2017. Please note that JCI revises and publishes standards for its accreditation programs on an ongoing and as-needed basis. With each revision, standards may be added, changed, or eliminated due to evolving health care practices, changes in the health care environment, and clarifications needed to the standards. Refer to the current editions of JCI standards manuals for requirements that may not be reflected in this book over time.

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