The Joint Commission

Infection Prevention and Control Issues in the Environment of Care

Fifth Edition

Edited by Michael Canales, CHFT, KSHE CHC, and Leon Young, MLS (ASCP)

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Published by Joint Commission Resources
Oakbrook Terrace, IL 60181 USA
https://www.jcrinc.com

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ISBN (print): 978-1-63585-332-2
ISBN (ebook): 978-1-63585-333-9

Printed in the USA

For more information about The Joint Commission, please visit https://www.jointcommission.org.

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Introduction

In early 2020, the emergence of the COVID-19 pandemic served to highlight the importance of infection prevention and control in health care organizations regardless of size or setting. The early stages of the pandemic quickly exposed challenges to infection prevention and control efforts ranging from proper use and availability of personal protective equipment (PPE) to balancing the need to perform surgery on infected patients in positive pressure operating rooms with the need to have negative pressure spaces to direct pathogens away from the operating room and out of the building. For organizations that shut down during the early phases of the pandemic, reopening came with its own infection prevention and control challenges.

Although health care–associated infections (HAIs) in the United States had been declining since 2015, in both 2020 and 2021, the first two years of the pandemic, the Centers for Disease Control and Prevention (CDC) reported increases in HAIs, including central line–associated bloodstream infections (CLABSIs), catheter-associated urinary tract infections (CAUTIs), ventilator-associated events (VAEs), and methicillin-resistant *Staphylococcus aureus* (MRSA) bacteremia.[1] These increases reveal the need for renewed back-to-basics attention to infection prevention and control.

The COVID-19 pandemic has been a source of tremendous upheaval and endless challenges for all health care organizations. Emergency management plans have been tested to their limits during patient surges, and staffing and equipment shortages compounded the problem. However, as increases in HAI rates show, COVID-19 doesn't exist in isolation; it must be considered alongside all infection risks—those that previously existed and those that are constantly emerging. As surges of COVID-19 recede and infection prevention and control efforts such as masking, distancing, and vaccination take hold, organizations must renew their focus on infection prevention and control to meet current needs and prepare for the emergence of new diseases that could create similar or even greater impacts.

Challenges of Infection Prevention and Control

It is a fundamental responsibility for health care organizations to keep patients and staff free of infection, whether that involves traditional focus on HAIs or preventing the spread of influenza, COVID-19, or other novel viruses that may emerge in the future. The challenges vary across health care settings. Hospitals and urgent care centers need to be able to accommodate surges of infectious patients while maintaining normal operations. Nursing care centers and assisted living communities must focus on addressing the needs of vulnerable populations. Outpatient settings, including dental and vision facilities, must mitigate risks of infection by taking such steps as improving cleaning, disinfection, and sterilization practices, moving to disposable instruments, and performing surveillance on sources of water used in patient care. And home care organizations will handle infection prevention and control differently because their staff members are providing care in patients' homes, where the organization has little control over the environment.

In addition, many factors that contribute to rising HAI rates may be beyond the control of health care organizations, regardless of setting. Increasing numbers of patients have compromised immune systems, resulting from the effects of post-COVID conditions.[2] Staffing may be limited due to staff illness, mental fatigue, or chronic understaffing by leadership. Supply chain issues result in shortages of medical supplies, including PPE. Facilities and equipment become old or obsolete, requiring renovation or construction. New infectious organisms such as COVID-19 appear, and familiar ones gain resistance. These challenges can be compounded in developing countries, where resources may be severely limited.

Although obstacles may seem overwhelming, many HAIs can be prevented, often with something as simple as proper hand hygiene. The Joint Commission, Joint Commission International (JCI), the World Health Organization (WHO), and CDC universally acknowledge the importance of hand hygiene. Before the COVID-19 pandemic, health care providers' compliance with hand hygiene guidelines were estimated to be only around 50%.[3] However, one bright spot in the HAI landscape, according to CDC, is that pandemic-related improvements in hand hygiene contributed to significant declines in *Clostridioides difficile* infections in 2021.[1]

Infectious Pandemics and the Urgency of Infection Prevention and Control

The COVID-19 pandemic laid bare the critical nature of infection prevention and control. With renewed emphasis on infection prevention and control practices, health care organizations should be better prepared to meet challenges posed not only by novel infections, but also from seasonal surges in influenza or respiratory syncytial virus (RSV), both of which can be serious for infants, older adults, and members of vulnerable populations.[4,5]

As organizations emerge from the pandemic, it is critical that they incorporate lessons learned from COVID-19 into their operations planning. This will require careful analysis of what worked well for infection prevention and control and what can be improved, considering everything from new cleaning, disinfection, and sterilization processes to the layout of the physical environment.

The Link Between Infection Prevention and Control and the Physical Environment

Every care setting needs a strong program to manage the physical environment (in the United States, this is commonly called the environment of care). 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 health care environment is the foundation upon which most infection prevention and control activities are built.

Issues surrounding room pressurization, the flow of staff and patients through an organization, and effective ventilation systems—all of which were significant areas of challenge and focus during the COVID-19 pandemic—are just a few of the interconnected physical factors that determine the effectiveness of the organization's infection prevention and control program.

Leadership in Infection Prevention and Control

Joint Commission and JCI standards recognize the connection between infection prevention and control and the physical environment in which health care, treatment, and services are provided. The standards require organizations to monitor, analyze, and improve conditions in the health care facility environment—including conditions affecting infection prevention and 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 infection in the health care environment and surrounding community. These standards and requirements place accountability for the effectiveness of an organization's infection prevention and control program squarely with its leaders, who are responsible for ensuring adequate staff training in infection prevention and control, including creating and implementing an emergency management plan/emergency operations plan that lays out how to respond to everything from a natural disaster to a surge of infectious patients; communicating and coordinating efforts with the health department and other community agencies; and allocating enough resources to support the program.

Of course, leadership in infection prevention and control relies heavily on the presence and effectiveness of an infection preventionist (or other infection prevention and control practitioner). This individual has the specialized education and training needed to manage the complex issues involved in infection prevention and control and is an expert in practical ways to prevent and control the spread of infections, including surveillance, investigating outbreaks, training staff, and developing policies.

However, the infection preventionist cannot do it alone (in some cases, a health care organization may not even have an infection preventionist on staff). It is vitally important to make infection prevention and control an organizationwide effort. This can work only when leadership establishes and promotes a culture of safety. The staff needs to feel comfortable questioning procedures and pointing out areas that need improvement, particularly in situations in which such procedures may need to change with little forewarning, as they did in the initial stages of the pandemic. Open communication should be encouraged among all levels. There can be no punitive atmosphere, explicit or implied. In fact, Joint Commission and JCI standards require organization leadership to create and maintain such a culture of safety. Everyone in the organization must recognize their role in infection prevention and control efforts.

New in This Edition

This new edition of *Infection Prevention and Control Issues in the Environment of Care* is designed to provide infection preventionists (and other infection prevention and control practitioners) and physical environment professionals with new and updated information on infection prevention and control issues related to the following:

- Hand hygiene
- Sharps management
- Demolition, renovation, and construction of health care facilities
- Medical equipment, including systems for high-level disinfection and sterilization, and new disposable equipment
- Utility systems, including prevention of waterborne illness
- Environmental services, including selection of appropriate cleaning products, and waste disposal
- Emergencies, epidemics and pandemics, and natural disasters

This book contains updated statistics and resources, standards that are current as of the publication date, and case studies that profile plans or projects that have proven

effective in other facilities. There is expanded guidance for organizations that span the breadth of Joint Commission and JCI accreditation programs, including not just hospitals and ambulatory facilities but also pharmacies, laboratories, home care services, nursing care centers, assisted living communities, and behavioral health care and human services facilities. Included are new tools and checklists, which can be adapted to help organizations assess performance, increase compliance, and enhance patient safety and quality of care. In addition, each chapter contains a Pandemic Lessons Learned sidebar highlighting important pandemic-related learning that corresponds to the chapter topic.

How to Use This Book

All health care organizations and facilities are responsible for establishing preventive measures for eliminating and mitigating infection 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, whereas 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 infection preventionists and other infection prevention and control practitioners, health care facility construction and project managers, environment of care professionals, and health care leaders around the world. Emergency managers, staff educators, and accreditation professionals can also benefit from the material included in this book. Some situations and requirements are not universally applicable; but unless otherwise stated in the text, the concepts in this book will be treated as applicable to all types of health care organizations. Users of this book are encouraged to consult the appropriate and most current Joint Commission or JCI accreditation manual to determine specific requirements (versus what might be provided in this book as a suggested or best practice).

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

Chapter 1—The Connection: Infection Prevention and Control and the Physical Environment

This chapter begins by establishing the current standards from The Joint Commission and JCI related to infection prevention and control and identifying risks faced in specific types of health care settings. It emphasizes the importance of an infection prevention and control plan based on the organization's identified risks, as well as the need to evaluate and adjust the plan on an annual basis. It also discusses proactive risk assessment tools, including tracers and tours of the environment. The Pandemic Lessons Learned feature focuses on repurposing spaces for patient surges.

Chapter 2—The Human Element: Staff and Infection Prevention and Control Compliance

This chapter focuses on the need to account for and understand human factors in infection prevention and control, including barriers to compliance and strategies to overcome them. Key focuses include hand hygiene, sharps management, and staff training and competency, including infection control risk assessment training for infection preventionists. The Pandemic Lessons Learned feature addresses the renewed focus on hand hygiene by CDC, WHO, UNICEF, and other organizations. The chapter also compares CDC and WHO guidelines for hand hygiene.

Chapter 3—Construction Projects: Infection Prevention and Control Considerations

This chapter discusses the role of infection prevention and control in construction and renovation of health care facilities. It outlines the importance of and applicability of different editions of the Facility Guidelines Institute's Guidelines for Design and Construction, which have been adopted in some form by many US states. It discusses design elements that can aid in infection prevention and control efforts and emphasizes the importance of the infection control risk assessment during construction or renovation. The Pandemic Lessons Learned feature focuses on design and construction elements that can improve infection prevention and control practices.

Chapter 4—Medical Equipment: Reprocessing for Infection Prevention and Control

Medical equipment reprocessing is particularly challenging for health care organizations, as demonstrated by high rates

of noncompliance with Joint Commission standards in this area. Readers are encouraged to pay close attention to this chapter, which focuses on cleaning and decontamination, disinfection, and sterilization of medical equipment. The chapter outlines the different levels of cleaning, disinfection, and sterilization needed for different types of equipment, as well as the need to establish an effective policy for monitoring compliance. It includes information on particularly high-risk, hard-to-reprocess equipment such as endoscopes and explores the US Food and Drug Administration (FDA) phase-out of fixed endcap duodenoscopes in favor of disposable components. The Pandemic Lessons Learned feature highlights a case study that outlines how one health care system developed a framework for infection prevention and control specifically in response to the COVID-19 pandemic.

Chapter 5—Utility Systems: Infection Prevention and Control Concerns

This chapter reinforces the connection between the physical environment and infection prevention and control efforts, focusing specifically on air handling, including pressurization of spaces, ventilation, and water distribution systems. It emphasizes the important role of maintenance staff in infection prevention and control, particularly in observing for issues such as mold or air flow irregularities. The chapter focuses on water-related issues such as management of condensate pans and moisture in intakes/ducts. One of the most common waterborne pathogens, *Legionella*—which has been particularly problematic in many health care organizations recently—is also discussed at length. The Pandemic Lessons Learned feature explores the increasing use of germicidal ultraviolet light (UV-C) for surface and air disinfection.

Chapter 6—Environmental Services and Medical Waste Disposal: Infection Prevention and Control Issues

This chapter explores aspects of the physical environment that are central to infection prevention and control, including housekeeping activities such as cleaning and laundry. It includes a discussion of the different types of surface disinfectants and the pathogens they are effective against, as well as management of regulated medical waste. The Pandemic Lessons Learned feature outlines disinfectants that the US Environmental Protection Agency (EPA) considers effective against COVID-19.

Chapter 7—Planning for and Managing Infectious Disease Emergencies and Disasters

This chapter focuses on infection prevention and control efforts during infectious disease emergencies and disasters. It outlines the four phases of emergency management, with particular focus on management of infectious patient surges and disease outbreaks such as those seen during the COVID-19 pandemic. It offers recommendations for conducting a hazard vulnerability analysis and implementing an emergency operations plan/emergency management plan. It discusses the relative advantages of indoor and outdoor decontamination, as well as the use of isolation rooms, anterooms, and other specific spaces during an emergency. The Pandemic Lessons Learned feature highlights a case study for responding to a potential infectious disease emergency.

Notes on Language

Infection prevention and control is a complex and critical need in all types of health care organizations and settings. In the United States, The Joint Commission has the following types of accreditation programs specific to health care settings and organizations:

- Ambulatory care organizations
- Assisted living communities
- Behavioral health care and human services organizations
- Critical access hospitals
- Home care organizations, including hospices and durable medical equipment providers
- Hospitals
- Laboratories
- Nursing care centers
- Office-based surgery practices

JCI has accreditation programs for the following types of health care organizations or settings:

- Ambulatory care organizations
- Home care organizations
- Hospitals and academic medical centers
- Long-term care organizations
- Laboratories
- Medical transport organizations
- Primary care centers

Throughout this book, the generic term *health care organization* is used to recognize and include all these settings.

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 to describe what is known in the United States as the environment of care. 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 Prevention and Control of Infections (PCI) and Facility Management and Safety (FMS) for standards in the JCI manuals.

Throughout the book, information not explicitly stated as a requirement of Joint Commission or JCI standards should be considered a recommendation.

About the Editors

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Acknowledgments

Our debt of gratitude is given to Holli Fort for her excellent job in writing and assembling this publication. Her efforts and skills are much appreciated.

Joint Commission Resources would also like to thank the following organizations for sharing their stories: Cincinnati Children's Hospital Medical Center, Cincinnati, Ohio; NewYork-Presbyterian Allen Hospital, New York City; Piedmont Healthcare, Atlanta, Georgia; HCA, Nashville, Tennessee.

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