

# Introduction

## The Infection Prevention and Control Program— A Global Perspective

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### Background

The twenty-first century has seen and will continue to see increasing emphasis on preventing and controlling infectious disease. Each year, millions of people in health care organizations and communities across the globe are exposed to infections from within health care settings and their communities. Globalization has led to increased transmissibility of diseases as well as to greater awareness of the social and economic effects of infectious disease. The good news is, health care providers across the globe are seeing advances in the design of medical devices, use of clinical practice techniques, faster vaccine development, and the positive effects of antimicrobial stewardship programs. These efforts and others are advancing infection prevention and control (IPC) goals in both developed and developing nations. Yet, health care-associated infections (HAI)s<sup>1</sup> and newly emerging infectious diseases, such as the ongoing global COVID-19 pandemic, have demonstrated the need for continuous efforts in mitigating and managing re-emerging and evolving infectious diseases.<sup>2</sup>

While the *APIC/JCR Infection Prevention and Control Workbook*, focuses primarily on HAIs, this new edition also underscores how infectious agents in the community can pose a risk to quality care and patient safety within health care settings. Infection prevention professionals in all health care settings must plan and prepare for both HAIs and infectious disease threats from a more global perspective, including preparedness for new viruses such as SARS-CoV-2 (Novel Coronavirus 2019/COVID-19) responsible for the COVID-19 global pandemic of 2020-2021.

Global infectious disease threats are not a new health care concern. In recent years, such threats have included outbreaks such as the SARS-CoV outbreak in 2003<sup>3</sup>; the Middle East Respiratory Syndrome (MERS-CoV) in 2012<sup>4</sup>; Zika virus in tropical Africa, Southeast Asia, the Pacific Islands, as well as transmissions in Florida and Texas in 2016<sup>5,6</sup>; and the West African Ebola Virus of 2014-2015, with confirmed cases in the United States<sup>7</sup> Currently the world continues to battle the COVID-19 pandemic, which resulted in more than half a million deaths in the US alone and more than 2 million deaths worldwide by early 2021.<sup>8,9</sup> As a result, this edition of the *APIC/JCR Infection Prevention and Control Workbook* includes a global perspective on infection prevention and control by highlighting both Joint Commission domestic and Joint Commission International standards and by continuing to offer potential strategies and solutions for all health care settings.

HAIs, such as pneumonia, urinary tract infections, bloodstream infections, and surgical site infections can be acquired anywhere health care is delivered, including inpatient acute care and long term care facilities as well as outpatient facilities, such as ambulatory surgical and dialysis centers, to name a few. They may result in extended hospital or residential stays, additional illness and treatment, and sometimes death. In all types of facilities, HAIs increase the demands on health care for supportive leadership, trained staff, a safe environment, collaboration among staff and public health agencies, and associated medical costs. In 2011, the US Centers for Disease Control and Prevention (CDC) published a report

suggesting that the cost of annual HAIs could be as high as \$45 billion.<sup>10</sup> In a 2013 meta-analysis study, total annual costs for five major HAIs alone (central–line associated infection, ventilator associated pneumonia, surgical site infections, *Clostridium (Clostridioides) difficile* infection, and catheter associated urinary tract infection) were estimated to cost \$9.8 billion annually (95% confidence interval, \$8.3–11.5 billion).<sup>1</sup> In addition, a 2019 study conducted in the Netherlands found national hospital costs attributable to SSIs following colectomy, mastectomy, and total hip arthroplasty—mainly from prolonged length of hospital stay—were estimated at €39.6 million<sup>11</sup>.

In the past, HAIs were thought to be inevitable and were considered a consequence of complex care delivered to increasingly ill patients. In other words, HAIs were an “expected” outcome of health care. However, there has been a shift in thinking. Many organizations are working toward achieving zero preventable infections and realizing that a proportion of HAIs are avoidable, making strides toward achieving the goal of zero preventable infections.<sup>12,13</sup> Eliminating HAIs is the ultimate goal of infection surveillance, prevention, and control programs. This goal makes an effective infection prevention and control program one of the most significant patient safety initiatives for any health care organization and should be a top priority for leaders and staff.

Since the third edition of this workbook was published in 2016, health care organizations have made great strides in reducing rates of several types of HAIs. In 2019, US hospitals saw 31% fewer central line–associated blood stream infections (CLABSIs) and 42% fewer *C. difficile* events compared to the 2015 national baseline. There has been a steady decline in other infections, including catheter-associated urinary tract infections and surgical site infections (SSIs), in part due to implementation of evidence-based practices.<sup>14</sup> In fact, the CDC conducted a point prevalence survey and concluded that between 2011 and 2015 there was a reduction in SSIs and urinary tract infections in acute care settings that was directly attributed to evidence-based IPC practices. In general, fewer patients had HAIs in 2015 than did in 2011,<sup>15,16</sup> and the trend continues. During this time, antimicrobial stewardship also has become an integral part of infection prevention in many care settings, further contributing to decreasing HAIs. A greater importance also has been placed on including and educating patients and their family advocates about their role in IPC efforts, as this is critical to help meet patient safety needs.<sup>17</sup>

## Standards and Requirements for Infection Prevention and Control

The Joint Commission’s philosophy and requirements are represented in its Infection Prevention and Control (IC) standards and associated elements of performance (EPs), as well as related standards within other accreditation chapters, including Leadership (LD), Environment of Care (EC), Human Resources (HR), and Medication Management (MM). In addition, and because there is close coordination between the US Centers for Medicare & Medicaid Services (CMS) CMS and Joint Commission domestic standards, for US organizations, CMS requirements are also discussed in this book, where applicable.

For the global community, similar requirements are addressed in JCI’s Prevention and Control of Infections (PCI) standards chapter and associated measurable elements (ME). Other JCI standards chapters, such as Quality Improvement and Patient Safety (QPS), Governance and Leadership (GLD), and Staff Qualification and Education (SQE) provide additional guidance.

Together these standards support infection prevention professionals in all settings to systematically develop, implement, and evaluate an effective infection surveillance, prevention, and control program. Relevant and Joint Commission and Joint Commission International accreditation standards are provided in all chapters of this book.

However, please note that while relevant Joint Commission and Joint Commission International standards are included in this book, the strategies presented here may go beyond what is required by the standards. This workbook is not meant to focus strictly on “compliance with standards” but to show good practices.

## Purpose of This Book

The *APIC/JCR Infection Prevention and Control Workbook, Fourth Edition* is intended to help health care organizations and their infection prevention teams identify infection risks and challenges in their designated health care setting by providing the strategies and resources to develop, implement, and evaluate a comprehensive IPC program to minimize those risks. Discussions, examples, tables, graphs, figures, case studies and other tools are provided to support organizations and infection preventionists (IPs) achieve an effective IPC program. This book is designed to help

those responsible for infection prevention and control enhance and improve all IPC practices and activities across the continuum of care to move toward safer care and healthier communities. The book does discuss health care organizations other than acute care hospitals; however, it must be noted that much of the book still focuses on the hospital setting. Other types of health care organizations are encouraged to consider the good practices for hospitals and extrapolate lessons and guidance as appropriate.

**Note:** *The strategies, tools, and examples discussed in this book do not necessarily reflect Joint Commission and Joint Commission International accreditation requirements for all settings. Always refer to the most current TJC and JCI standards, applicable to your health care setting, to ensure compliance.*

## Using the APIC/JCR Infection Prevention and Control Workbook

The chapters in this book are organized to help infection prevention professionals develop a comprehensive IPC program by first providing an overview for designing and managing an effective IPC program and then addressing in more detail the following key components of the IPC program:

- Assessing risks
- Setting goals based on those identified risks
- Developing a written IPC plan based on identified goals and risks
- Implementing the written plan
- Evaluating plan and program effectiveness

To help reduce the occurrence of infections and the likelihood of transmission of pathogenic micro-organisms to patients, staff, and visitors, a systematic and proactive IPC program must be planned, implemented, and monitored and must include everyone involved in the daily operations of an organization—including top leadership and administration, clinical personnel, environmental services, sterilization and purchasing services, occupational health, patients and their families.

These topics are discussed in the following chapters:

- *Chapter 1 Designing and Managing an Effective Infection Prevention and Control Program*
- *Chapter 2 The Role of Leadership in Infection Prevention and Control*
- *Chapter 7 Maintaining a Safe Environment of Care*

- *Chapter 8: Cleaning, Disinfection, and Sterilization of Medical Devices and Equipment*
- *Chapter 10: Occupational Health Issues*

Because assessing risks, surveillance, education, and communication are such essential components for the effectiveness and success of an infection prevention program, discussion related to these topics are covered in depth in the following chapters:

- *Chapter 3: A Risk-Based Approach to Infection Prevention: Performing the Risk Assessment and Creating the IPC Plan*
- *Chapter 4: Planning and Implementing an Effective Surveillance Program*
- *Chapter 5: Planning for and Managing Infectious Disease Emergencies*
- *Chapter 6: Implementing Clinical Strategies to Reduce Infection Risk*
- *Chapter 9: Communication and Education Strategies for Infection Prevention and Control Programs.*

The effectiveness of the IPC program occurs through the vigilant assessment of the status of goals and objectives and how the program integrates with and improves patient safety and the quality of care. Chapters 11 and 12 address these important issues.

- *Chapter 11: Evaluating the Effectiveness of an Infection Prevention and Control Program*
- *Chapter 12: Integrating Infection Prevention and Control into Patient Safety and Performance Improvement*

The figure below includes the topics covered in this workbook and illustrates how they are all components of an effective IPC program.

## A Collaborative Effort

This workbook continues the collaboration between the Association for Professionals in Infection Prevention and Control and Epidemiology (APIC) and Joint Commission Resources (JCR)—a division of The Joint Commission Enterprise. APIC is a nonprofit professional organization with the mission to create a safer world through the prevention and control of infections.<sup>18</sup> The mission of Joint Commission Resources is to continuously improve the safety and quality of health care in the US and in the international community.<sup>19</sup> The two organizations have joined together to create the fourth edition of this workbook, which is designed to assist IPC teams in all health care settings and countries to establish a



comprehensive risk-based IPC program to protect patients, staff, and families from infections acquired in the community and in health care facilities. Both APIC and JCR provide support for the development of effective IPC programs. APIC supports infection professionals through publications, education, practice guidance, policy, and advocacy. The Joint Commission<sup>20</sup> and Joint Commission International<sup>21</sup> use published standards as a structure for support. Other organizations such as the Society for Healthcare Epidemiology of America (SHEA)<sup>22</sup>

and the Centers for Medicare and Medicaid Services (CMS)<sup>23</sup> also support strong IPC programs with regulations, evidence-based guidelines, consensus documents, and more. All agree that IPC programs should be comprehensive, collaborative, and interprofessional and pursue HAI reduction with multi-interventional programs based on evidence-based strategies.

Finally, the *APIC/JCR Infection Prevention and Control Workbook, Fourth Edition* continues to incorporate the experience of the IPs who work across the US and

throughout the world who have shared their expertise and knowledge of infection surveillance, prevention, and control issues.

## About the Contributors

**Vicki Gillie Allen**, MSN, RN, CIC, FAPIC, is the Director of the Infection Prevention and Control Department at a not-for-profit community hospital in Gastonia, NC. Her responsibilities include the oversight of infection prevention and control for the regional health system of CaroMont Health, including physician practices, urgent care, hospice, emergency facilities, and its anchor, a 435-bed hospital. Allen has more than 23 years of experience in infection control. In addition to her role as director, she has participated in and provided infection prevention and control consultation and education to other settings, including long term care facilities. As an RN with national board certification in infection control, Allen has been actively involved with professional organizations, including statewide programs for the Association for Professionals in Infection Control and Epidemiology (APIC) and North Carolina President 2018 and Arkansas President in 2007. She also served on the national APIC Communications Committee from 2013 to 2018 and as the APIC Text editor and author from 2014 to 2020. Allen earned a Bachelor of Science degree in nursing from Kaplan University and a Master of Science in nursing education from the University of Texas at Tyler.

**Kathleen Meehan Arias**, MS, MT(ASCP), SM(AAM), CIC, FAPIC has worked in the infection prevention and control field since 1980. She has infection prevention and control experience in a variety of health care settings, including acute care, long term care, and ambulatory health care. Arias has a Bachelor of Science degree in medical technology and a Master of Science degree in clinical microbiology. She is certified in infection control by the Certification Board of Infection Control. Arias has authored books, chapters, and articles on a variety of infection prevention and control topics. She was a co-editor and author of the first three editions of the *APIC/JCR Infection Prevention and Control Workbook* and is the author of the surveillance chapter in the *APIC Text of Infection Control and Epidemiology*.

Arias is an active APIC member and has served in many capacities at the local and national levels. She was co-chair of the national APIC Education Committee from 1998 to 2000 and served as APIC President in 2006. In

2011, Arias received APIC's Carole DeMille Award in recognition for her contributions to the field of infection prevention and control.

**Ruth Carrico**, PhD, DNP, FNP-C, CIC, FSHEA, FNAP, is Professor and Family Nurse Practitioner with the University of Louisville School of Medicine, Division of Infectious Diseases. She serves as director of epidemiological research in the University's Center of Excellence for Research in Infectious Diseases (CERID) and as director of the Center for Education and Training in Infection Prevention. Carrico has received training specific to health care epidemiology from the Centers for Disease Control and Prevention (CDC) in conjunction with the Rollins School of Public Health at Emory University in Atlanta and the Society for Healthcare Epidemiology of America (SHEA).

Carrico served as editor for the APIC Text of Infection Control and Epidemiology from 2005 to 2012. In 2008, she was appointed to the National Biosurveillance Subcommittee (NBS) Advisory Committee to the CDC Director, and in 2010 she became a SHEA Fellow. In 2011, Carrico was appointed by Secretary Sebelius, o the Healthcare Infection Control Practices Advisory Committee (HICPAC). In 2012, she was presented with the Carole DeMille Achievement Award by APIC, and she began serving the National Foundation for Infectious Diseases as the Board's Nurse Planner in 2013. In 2014, she became a Robert Wood Johnson Foundation Executive Nurse Fellow alumna and then served as president of the Certification Board of Infection Control and Epidemiology, Inc. (CBIC) in 2016. In 2018, Carrico served as the Editor-in-Chief for the University of Louisville's open access *Journal of Refugee and Global Health*. She became president of the Kentucky Nurses Association and in 2020 and was recognized as a Distinguished Fellow in the National Academies of Practice.

**Loretta L. Fauerbach**, MS, FSHEA, FAPIC, CIC is the lead infection preventionist for Fauerbach & Associates, LLC. Fauerbach served for more than 28 years as director of Infection Prevention and Control for Shands Hospital at the University of Florida. Her expertise encompasses the continuum of health care. Fauerbach received APIC's, Carole DeMille Achievement Award in 2007 for her contributions/achievements in the field of infection prevention and control. Fauerbach is an active member of APIC, the Society for Healthcare Epidemiology of America (SHEA), and the American Society for Microbiology (ASM).



She has served on APIC's board of directors and on a number of APIC committees. Fauerbach was also cochair of APIC's Nominating and Awards Committee. In 2002 she testified before the Institute of Medicine on APIC's behalf related to HAI data. Fauerbach has served as APIC's liaison to the Association for the Advancement of Medical Instrumentation (AAMI), HICPAC, the US Food and Drug Administration (FDA), and the Infectious Diseases Society of America (IDSA) during which multiple sentinel guidelines were produced by those agencies/associations. She was also APIC's leader for the SHEA/APIC/CDC Communication Network. She represented APIC on The Joint Commission's expert panels for monographs on hand hygiene, influenza vaccination, and Tdap vaccination. Fauerbach has presented at regional and national meetings, authored several books and articles for peer-reviewed journals, and is currently a member of HICPAC.

**Sylvia Garcia-Houchins**, RN, MBA, CIC, Joint Commission, is the Director of Infection Control and an Ambulatory Surveyor. She has provided infection prevention and control consultation in a variety of health care settings, including hospitals, health clinics, and dialysis centers both domestically and internationally. She has trained nurses, microbiologists, and public health graduates to certification in infection control. Garcia-Houchins has been active in APIC and CBIC; most recently she chaired the Test Writing Committee. Garcia-Houchins has also conducted hospital assessments and developed educational programs responsive to the needs of the community, geographic region, and country and has authored articles and book chapters related to infection prevention and control.

**Kathleen Gase**, MBA, MPH, FAPIC, CIC, is the Director of Clinical Excellence at Barnes-Jewish St. Peters and Progress West Hospitals in the St. Louis, MO area. She has previous work experience with BJC HealthCare, the New York State Department of Health, and Memorial Sloan-Kettering Cancer Center. Gase earned her undergraduate degree at Washington University in St. Louis, MO, her master's in Public Health at Hunter College in New York City, and she returned to Washington University to complete her MBA. She is certified in Infection Prevention and Epidemiology, a Fellow of the Association for Professionals in Infection Control and Epidemiology (APIC) and is currently serving on the APIC Board of Directors.

**Linda R. Greene**, RN, MPS, CIC, FAPIC, is the Director of Infection Prevention, at the University of Rochester Highland Hospital, Rochester, New York. She has extensive experience in infection prevention in acute care, long-term care, and ambulatory surgery settings. She held leadership roles in her local APIC chapter before becoming a member of the APIC Board of Directors in 2010. She was secretary of the APIC Board in 2012–2013 and served as APIC president in 2017. Greene was also president of the board for APIC Consulting Services in 2015, and she continues to serve APIC and the infection prevention and control profession in myriad ways, including as an advisor and contributor to APIC position papers and implementation guides, as an APIC representative to the 2020 CDC Decennial Steering Committee, and as a frequent presenter at regional, national, and international conferences. The author of dozens of peer-reviewed publications, Greene is an expert on quality improvement, antimicrobial stewardship, and health care–associated infections. She served on the *AJIC* editorial board from 2015 to 2017. In 2020, APIC awarded her with the prestigious Carole DeMille Award, which is given annually to an infection preventionist with visionary leadership and extraordinary contributions to the profession. She has also received numerous awards for leadership and nursing.

**Patti G. Grota**, PhD, CNS-M-S, CIC, FAPIC, CHSE is an expert infection prevention professional with more than 30 years of experience in academia and diverse practice settings, including acute, ambulatory, and long term care. In her role as Infection Prevention Director of a Veteran's Administration Healthcare Facility for more than 15 years, Grota led the facility through successful Joint Commission-accreditation cycles. She has advanced experience in developing, implementing, and evaluating infection prevention and control programs. Currently, she teaches infection prevention and control and leadership to nurses and other health care students.

Grota has served APIC both nationally and locally. She is the clinical editor of the 2014 Edition of the *APIC Text of Infection Control and Epidemiology* and served as chairperson of the *APIC Text On-line* Editorial Panel from 2014 to 2018, coordinating its transition to an electronic publication. She has served on the APIC Chapter 71, San Antonio Board of Directors as a member and as president. Currently, she is a member of the APIC National Research Committee. She has numerous national presentations on infection prevention, as well as articles in peer-reviewed

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Ivaska holds a bachelor of science in biology and an MPH and is nationally board certified in infection control and epidemiology. She completed her thesis on the epidemiology of community-acquired versus health care-associated methicillin-resistant *Staphylococcus aureus* (MRSA) and has advanced training in hospital epidemiology from the CDC.

**Wai Khuan Ng**, PhD, RN, CIC, CPHQ, FAPIC, is Principal Consultant, Asia Pacific & International Infection Prevention and Control for Joint Commission International.

She has more than 25 years of experience in health care and 18 years of experience in infection prevention and control. An expert in infection prevention and control, Ng provides consulting services for infection prevention and control in international settings and across the health care continuum, including program assessment, professional development and mentoring, education and training, and product development. Ng has broad experience practicing and teaching about infection prevention and control and has published and presented extensively in this area.

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**Chaz Rhone**, MPH, CIC, FAPIC, received a master's degree of public health in epidemiology from the University of Florida in 2007 and immediately began his career as an infection preventionist. He has been certified in infection control since 2012 and has worked both in the public and private sector, with experience in acute and long term care settings. Currently, Rhone is a Division Manager for HCA Healthcare, where he oversees the infection prevention programs for five acute care facilities in the Orlando, Florida area. Rhone is an active member with the Association for Professionals in Infection Control and Epidemiology (APIC), currently serving on the Professional Development Committee and the Florida Professionals in Infection Control, where he also served as former president and board member. He has published extensively in peer-reviewed journals and lectured at conferences at the state and national levels. In 2016, Rhone received the APIC Heroes of Infection Prevention Award for his work in CAUTI prevention. He also was named as one of University of Florida's College of Public Health and Health Professions Outstanding Alumni in 2018. In 2019, Rhone became an APIC Fellow. He is passionate about patient safety, leadership, and advancing the field of infection prevention.

**Angela H. Rupp**, MT, MS, CIC, FAPIC began her career in infection prevention in 1998 and has served as an infection preventionist in long term care, at a community hospital, an academic medical center, and most recently as the director at a free-standing pediatric hospital. A member of the Association for Professionals in Infection Control and Epidemiology (APIC), Rupp served as the 2010 and 2011 Pediatric Section Chair for APIC and, in 2017, was awarded APIC's Heroes of Infection Prevention awards for her work associated with an outbreak related

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**Barbara M. Soule**, RN, MPA, CIC, FSHEA, has served as principal consultant in infection prevention and control for Joint Commission Resources and Joint Commission International. She also served as Director of Infection Control and Epidemiology, Director of Safety, and Director of Quality Management Services at Providence St. Peter Hospital in Olympia, Washington, where she managed programs in quality and performance improvement, hospital epidemiology and infection control, risk management, utilization management, clinical research, staff education, and care management services. Soule was the editor-in-chief of the first APIC curriculum for infection control (now APIC Text), served on the editorial board of the *American Journal of Infection Control*, and as editor of *Best Practices in Infection Prevention and Control: An International Perspective*, which was co-published by JCI and the Society for Healthcare Epidemiology of America (SHEA). Soule also is member of the editorial board of the *International Infection Control and Public Health* and is former president of both Association for Professionals in Infection Control and Epidemiology (APIC) in 2003 and the Certification Board of Infection Control (CBIC) in 1988. She also was a member of the CDC's Healthcare Infection Control Practices Advisory Committee (HICPAC) from 2007 to 2010. Soule received the Carol DeMille Award in 1989 and the President's Distinguished Service Award in 2009 from APIC. She also was awarded the Advanced Infection Preventionist Award from SHEA in 2009.

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## Acknowledgments

APIC and JCR would like to thank the following individuals for their support, contributions, and technical review of chapters.

- Lorene Campbell, BSN, RN, CIC, APIC Communication Committee/Hospital Division, Director Infection Control, Kindred Healthcare
- Brenda Ehlert, BS, MT (ASCP), MBA, CIC, FAPIC, Director Infection Prevention, Ascension Wisconsin
- Patti G. Grota PhD, CNS-M-S, CIC, FAPIC, CHSE, University of Texas Health Science Center, San Antonio, TX
- Lori Kay Groven, MSPHN, RN, CIC, Infection Preventionist, TRIA Orthopaedic Center, Bloomington, MN
- Martin Levesque, MPH, MBA, CIC, FAPIC, System Director, Infection Prevention and Control, Henry Ford Health System, Detroit, MI
- Kathleen McMullen, MPH, CIC, FAPIC, Christian Hospital
- Sara M. Reese, PhD, MPH, CIC, FAPIC, Swedish Medical Center
- Angela H. Rupp, MT, MS, CIC, FAPIC, Cedar Lake, IN
- April Sutton, MSN, RN, CIC, Texas Health Resources
- Marie H. Wilson, MSN, RN, CIC, Methodist Dallas Medical Center
- Marlene Fishman Wolpert, MPH, CIC, FAPIC, Long Term Care Infection Preventionist, The Miriam Hospital, A Lifespan Partner, CITY, STATE, and Independent Consultant, Providence, Rhode Island.

APIC and JCR would also like to acknowledge the contributions of the following health care professionals for use of the risk assessment tools included in Chapter 3.



- Michelle A. Barron, MD, Senior Medical Director, Infection Prevention and Control, UHealth Metro Denver
- Cathleen Carroll, MLT CIC; Infection Prevention Supervisor at Barnes-Jewish West County Hospital
- Amber Conrad, RN BSN CIC; Infection Prevention Specialist at Parkland Health Center
- Ashley Heller, MPH, CIC, Manager, Infection Prevention and Control, UHealth Metro Denver
- Kathleen McMullen, MPH CIC FAPIC; Interim Director of Quality and Analytics at Christian Hospital and Northwest Healthcare
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- Rachael Snyders, MPH, BSN, RN, CIC, FAPIC Manager, Infection Prevention Center for Clinical Excellence BJC HealthCare
- Luke Starnes, PhD RN; Interim Manager of Infection Prevention at Missouri Baptist Medical Center
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## TRY THIS TOOL



The Tools to Try in this book are available as downloadable, customizable resources that can be distributed internally to health care staff. To access these tools, click on the Try This Tool box in each chapter or visit: URL

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