

Amber Hogan Mitchell

Preventing Occupational Exposures to Infectious Disease in Health Care

A Practical Guide

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 Springer

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ISBN 978-3-030-56038-6 ISBN 978-3-030-56039-3 (eBook)
<https://doi.org/10.1007/978-3-030-56039-3>

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The registered company address is: Gewerbestrasse 11, 6330 Cham, Switzerland

In memory of:

My mom – Jane Culwell Hogan

My stepmom – Patricia Kolmer

My gram – Eugenia “Jean” Warfield Culwell

*This is in honor of them, and to current and
future generations of healthcare heroes
serving others in every corner of the globe.*

The world would not turn without you.

Foreword

Hospitals are dangerous places to work—injury and illness rates among healthcare workers is far higher than the rates among construction workers or coal miners. Keeping healthcare workers safe is the key to keeping patients safe. An important component of this is prevention of infectious disease.

If anyone doubted the importance of preventing occupational exposure to infectious disease in healthcare settings, the global COVID-19 pandemic surely changed that. Healthcare workers were on the front line, fighting the epidemic and saving lives. Thousands of these workers were sickened by the virus, and many died.

Failure to adequately protect healthcare workers contributed to the spread of the epidemic. The absence of adequate preventive programs, especially at the beginning of the epidemic, infected some workers and required many to be quarantined. This left fewer to treat patients, making the work of the remaining workers that much more difficult and increasing their risk of infection.

Protecting healthcare workers from infectious disease is not rocket science. We know how to do it right, enabling healthcare workers to be safe while providing the best care to patients and clients.

Much of what needs to be done is explained in clear terms in this book, *Preventing Occupational Exposures to Infectious Disease in Health Care: A Practical Guide*. Dr. Amber Hogan Mitchell uses her decades of experience in occupational safety and health and infection prevention to provide valuable information and practical guidance that will be useful to anyone in the healthcare sector.

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Acknowledgments

This book is a labor of love. It is the culmination of years of learning from the tireless work of my mentors, teachers, colleagues, friends, and family. It is because of the instillation of their dedication and humility in so many of us that it was necessary to write it all down so that it could serve others. My grandfather was the first physician I knew, and his running off with medical bag in hand to deliver babies and provide medical care at all hours of the day and night imprinted in me the desire to serve professionals like him.

Thank you to those that have influenced my life and career: GWU, Binghamton, USUHS, the US Army, Indian Health Service, Public Health Service, Faccia Luna, OSHA, NIOSH, CDC, BD, University of Texas, J&J, Vestagen, International Safety Center, APHA OHS Section, NIEHS, University of Maryland, and each and every healthcare worker I have had the honor to know and work with.

E pluribus unum.

Many images in this book were created by Chelsey Armstrong, an exceptionally talented artist and graphic designer. Thank you Chelsey for sharing your gifts for the benefit of public health.

Thank you to Springer Senior Editor Janet Kim, who graciously guided me through this writing, editing, and publication process. You made something this daunting manageable and enjoyable.

Gratitude to Heather Monaghan, whose idea this was in the first place. Thank you!

Thank you to my husband—John Christopher Mitchell. Every human deserves a cheerleader as true as you. You make me laugh and keep me strong.

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About the Author

Amber Hogan Mitchell, DrPH, MPH, CPH, is currently the International Safety Center's President and Executive Director. The Center distributes the Exposure Prevention Information Network (or "EPINet") free to hospitals to measure occupational exposures to blood and body fluid and other potentially infectious materials that cause illness and infection in the working population. EPINet is the world's most widely used surveillance tool for this type of data and has been distributed to thousands of US hospitals and nearly 100 countries.

Dr. Mitchell's career has been focused on public health and occupational safety and health related to infectious disease. She has worked in the public, private, and academic sectors. Dr. Mitchell began her career as the very first OSHA National Bloodborne Pathogens Coordinator and a Senior Industrial Hygienist and has received several Secretary of Labor Excellence awards for her work on healthcare worker safety as well as bioterrorism and public preparedness. She sat on a team of dedicated professionals that integrated the Needlestick Safety and Prevention Act into the regulatory landscape.

Dr. Mitchell has held regulatory and medical affairs positions for medical device companies. As a doctoral scholar with Centers for Disease Control and Prevention (CDC) and National Institute for Occupational Safety and Health (NIOSH), she completed her Doctor of Public Health (DrPH) degree at the University of Texas School of Public Health. She holds a Bachelor's Degree in Psychology from Binghamton University and a Master's Degree in Public Health from The George Washington University. Dr. Mitchell is Certified in Public Health as an esteemed member of the very first CPH cohort offered by the National Board of Public Health Examiners. She was the 2019 Chair of the Occupational Health and Safety (OHS) Section of the American Public Health Association (APHA).

Dr. Mitchell continues to serve the country as a senior science advisor for the National Institute of Environmental Health Sciences (NIEHS) for Worker Training Program for COVID-19. She is also Adjunct Faculty at the University of Maryland School of Medicine, Department of Occupational and Environmental Medicine.

She will continue to fight for a world where there is no illness or infection as a result of one's work.

Dr. Mitchell also has a passion for nutrition, dietetics, and wellness. She is an avid cook and lover of wine. She lives with her husband, dogs, and cat on the water in beautiful League City, Texas, just outside of Houston in the United States.

Chapter 1

Introduction



Objectives

- Illustrate why this *Practical Guide* is different and unique from other resources available.
- Describe the rationale and flow of the book.
- Delineate how simple yet robust programs in occupational infection prevention can make a measurable difference in public health.

What's Different About This Book?

People working in healthcare settings sustain a higher incidence of occupational illness than any other industry sector (BLS 2017). This includes 20 million people (and rising yearly) that carry the risk of illnesses and infections that can affect all organs and organ systems, including the skin and respiratory systems, just by going to work. These occupational illnesses are most frequently caused by exposure to viruses, bacteria, and other microbiologic and physical irritants including influenza, multidrug-resistant organisms like MRSA, tuberculosis, respiratory viruses including coronaviruses like SARS-CoV-2, and physical splashes of blood and body fluids that can result in exposure to HIV and/or hepatitis C.

The winter of 2019/2020 will forever be known as the season that changed generations of people around the world. When SARS-CoV-2 emerged among patients with atypical pneumonia in China in December 2019, many public and occupational health practitioners became concerned. This will be discussed more in Chap. 11. The COVID-19 pandemic serves as an incredible illustration of the critical importance of careful attention on occupational infection prevention and its impact on global public health.

In addition to biological hazards, occupational illness in health care like in other industries can also be caused by exposures to chemical and physical irritants like cleaners, detergents, disinfectants, sterilants, radiation, dusts, particulates and more; however exposures to infectious diseases tend to be the most serious and potentially devastating as a result of direct patient care.

With so much global focus on preventing similar types of exposures in patient populations and preventing healthcare-associated infections (HAIs), there is less focus on protecting those providing patient care from similarly devastating illnesses or infections.

This book serves as a practical guide for protecting workers from infectious disease. It serves as a reference for program design and implementation from an occupational infection prevention and control point of view. It serves as a roadmap, a recipe, or a blueprint – for building, maintaining, evaluating, and growing programs, policies, and campaigns designed to prevent occupational exposures to infectious disease in healthcare.

The guide is intended to be used by those with the greatest responsibility of all – protecting one of our most valuable assets, healthcare personnel. *Practical Guide* users may include professionals with job functions or tasks in occupational or employee health and safety, infection prevention and control, biological safety, infectious disease, risk management, and/or environmental health and safety in healthcare settings. The guide is meant to serve those with varying levels of experience in occupational health and/or occupational infection prevention. For those new to the role, background and fundamental information has been included to help you gain confidence as you ramp up in your role. For seasoned professionals, there are tools, resources, and ideas that are new and ready for you to roll out or pass along.

This book is not intended to sit dusty and sun bleached on a shelf, in a box, or to be used as a riser for a computer monitor. It is meant to be stained with coffee rings, its pages dog-eared with a book spine that opens and lays flat without even the slightest press. It is not only a “how to” but a when and where. And most importantly, it details the *why* and provides the real public health significance of building better, safer programs in health care that protect its workers from exposure to infectious and bloodborne disease that cause illness and infection and that have the potential to negatively impact patient and community care at a time when we need it most.

Ready-to-Use Information

Practical Guide readers will have ready-to-use information to either build a new occupational exposure prevention and control program or expand and revitalize an existing one. Not only is the reasoning behind building successful programs provided within these pages, but there are also sample programs, plans, campaigns or blitzes, and recordkeeping logs to use daily, weekly, monthly, or even as you update plans and policies annually.

The chapters that lay ahead are designed to serve as justification, form, function, and utility. They are laid out for quick reference, including information on what, when, how, and most importantly – why. The design and flow is built for success.

Chapters

- Public Health Significance
- Controlling and Preventing Occupational Illness and Infection
- Microbiology Basics
- Occupational Safety and Health Administration (OSHA) Regulatory Compliance
- Other Regulatory Requirements, National Standards, and Accreditation
- Performing a Hazard Assessment and Building an Exposure Control Plan
- Institutional and Administrative Controls
- Engineering Controls and Safer Medical Devices
- Personal Protective Equipment Placement and Use
- Facing a Modern Pandemic
- Making It All Work

Each chapter also provides practical information, education plans, and training materials, as well as implementation exercises and campaign tools.

Establishing Your Impact

Occupational infection prevention and control professionals are often called to task to defend or justify the reasons behind occupational health and safety and infection prevention and control programs. When resources are thin or a committee has been called to decide whether facility allocates funds to building a new diagnostics lab or add a much needed FTE in your department, you may find Chap. 2 Public Health Significance most useful to help you justify the need for ongoing support.

It doesn't help that programs of the past had the word "control" in the title: Infection "Control," Exposure "Control," and Damage "Control." There has been migration to substitute the term "control" for "prevention.": Infection "Prevention" and Exposure "Prevention" with damage control migrating to "Risk Management." A regular illustration to leadership to include what has been controlled, so that prevention can flourish. In other words, if we *control* a situation in the emergency department where personal protective equipment (PPE) is now immediately accessible to all personnel at every bedside, then we have averted (*prevented*) risk (a potential infectious outbreak).

This chapter includes the evidence base needed to not only defend a policy, program, action, or *control* to leadership, management, fellow colleagues, and staff but also to provide a solid grounding to establish why worker safety and health is

critical to not only patient safety but to overarching facility safety, security, and even public health more broadly so that infectious crises and risk can be *prevented*.

While the information herein will be based on scientific rigor, evidence, and centuries of experience, peer-reviewed literature does not tell the whole story. Thanks to hundreds of years of dedication from the pioneers in worker safety and health – like Florence Nightingale, Alice Hamilton, Joseph Lister, even Benjamin Franklin, and so many others – and our governmental agencies like the National Institute for Occupational Safety and Health (NIOSH), the Occupational Safety and Health Administration (OSHA), the Environmental Protection Agency (EPA), and more, the scientific justification has been performed. Instituting the hierarchy of controls saves lives.

Decades of advancements in engineering controls like ventilation systems and high-efficiency particulate air (HEPA) filtration work to physically remove hazards from air. Barriers like personal protective equipment (PPE) when used properly halt microbes from moving from place to place and person to person. Annual employee training improves awareness and increases preventive skills. And who could be blinded to whether they are wearing a respirator or not? Or whether they are using a medical device with a safety mechanism or not? Or whether they've had a flu shot or not.

Providing Practical Information

The chapters ahead hold a host of practical information. They are proverbial recipes in a cookbook. Included are model plans, analyses, exposure incident logs, training elements, and more. Many elements can be copied and put in a three-ring binder or carried around in a hardy clipboard when doing rounds or going to committee meetings.

Model programs and plans:

- Exposure control plans
- Hazard control plans
- Job hazard analyses
- Sharps injury and blood/body fluid exposure logs
- Occupational infection prevention rounding checklist
- Cost-benefit modeling and more

These model programs and plans are drawn from key regulatory agencies like OSHA and EPA; credible research and clinical government centers like NIOSH and the CDC; national professional associations like the American Industrial Hygiene Association (AIHA), the American Society of Safety Engineers (ASSE), the Association for Professionals in Infection Control and Epidemiology (APIC), the Society for Healthcare Epidemiology of America (SHEA), the American Public Health Association (APHA), the Infectious Diseases Society of America (IDSA), the American Nurses' Association (ANA), the Association for Occupational Health

Professionals in Healthcare (AOHP), the Association for Biosafety and Biosecurity (ABSA), the National Fire Protection Agency (NFPA), and others; and organized labor and unions like the Service Employees International Union (SEIU), the American Federation of Governmental Employees (AFGE), the AFL-CIO, the American Federation of Teachers (AFT), and more.

Since there are more people from around the world accessing US healthcare organizations than ever before, increasing the potential for exposure to emerging and re-emerging infectious disease threats to healthcare workers, this guide will also provide sample programs and plans from global champion groups including the World Health Organization (WHO) and Médecins Sans Frontières (aka Doctors Without Borders).

It is important that once a plan is built and in action that it remains stoic and solid over time – it is the foundation on which all other safety programs are built. But in order to best suit the personnel and unique demands on your facility, it also needs to have the capability to flex and flow based on new standards, requirements, external threats, internal risks, or organizational changes. As such, these programs and plans are built with room to grow. In OSHA terms, they are “performance-based” plans and can be adjusted based on how well your organization is (or isn’t) doing.

Utilizing Educational Plans and Training Modules

Not only do nearly all federal compliance standards require the development and execution of employee/staff education and training, but many also are offered to new employees at the time of hire (and transfer) and to all current employees at least annually. This is true not just for OSHA and EPA regulatory standards but also for Joint Commission and other accreditation and licensing organizations like state departments of health and public health.

If you are not a full-time educator or staff trainer, the development and rollout of these educational plans can be a daunting task. The educational resources in the guide will provide some educational plans and sample training modules for topic areas.

New Hire, Preplacement Training Let’s say, for example, there is a new hire orientation training for professionals in the clinical diagnostics lab that will not be administering direct patient care. You know their background in microbiology is stronger than any other professional group entering the facility, so you can scale back on the plans and modules for that group and focus more on *Occupational Infectious Disease Risk, Regulatory Compliance, and PPE Placement and Use*. Then you can build implementation plans and evaluation tools around those units or maybe even have them help you build up the microbiology modules for others.

Seasonal or Ongoing Annual Training Or say you have a new group of medical residents arriving this summer and your facility just instituted several new safety-