Foreword

Institutions, especially healthcare facilities and universities, are complex and may offer many hazards to workers and to those served by these institutions. In the U.S., the healthcare sector is one of the fastest growing segments of our economy. Currently, there are approximately 14 million people employed in some aspect of health care. This is also a future area of employment for environmental health and safety students.

In 1973, Bond, Michaelsen, and DeRoos authored *Environmental Health and Safety in Health-Care Facilities*, which was the first textbook that focused on environmental and occupational hazards in hospitals and other healthcare operations. Despite this book, these healthcare hazards received relatively little attention until recently. The AIDS epidemic of the early to mid-1980s provided some impetus for federal regulators to take a closer look at healthcare worker protection. However, for most of the last 50 years, voluntary compliance with the Joint Commission on Accreditation of Healthcare Organizations (known as the Joint Commission or JCAHO) has been the primary motivator for environmental health and safety management in hospitals. While voluntary compliance has undoubtedly resulted in improvements, certain areas, such as ergonomics and employee exposure to hazardous chemicals, have been neglected. In addition, there are new concerns that were never considered in 1973. Hospitals and universities may be considered critical “soft targets” for potential terrorists. What better way to disrupt a community than to disable its healthcare system or harm college students? Emergency response, including respiratory protection, must now be an important element in our environmental health and safety programs. There have also been a series of new disease threats since the beginning of the AIDS epidemic. These include the hepatitis C virus, severe acute respiratory syndrome (SARS), multi-drug resistant bacteria, and now the potential for human-to-human spread of avian influenza. There have also been technological advances in diagnostic and treatment methods, such as the use of lasers and nanotechnology, which may present risks to healthcare and university workers and students. These and other emerging problems will require the services of properly trained institutional environmental health and safety professionals.

The primary reason for writing this book is to provide a textbook for environmental health and safety students who wish to learn more about controlling hazards in institutional settings. It is intended for use in an undergraduate course for junior and senior students. Introductory chemistry is a pre-requisite; ideally, students also should have taken a class in microbiology.
Many of the chapters have classroom activities that are designed to provide a sense of realism to accompany the lecture materials. Site visits to hospitals and other types of healthcare facilities may provide another effective tool in making the materials more accessible for the students. While not required, classes in epidemiology and industrial hygiene would benefit students taking this course.

This volume will focus on hospitals and universities. While this book is intended to be a college textbook, it should also be useful for environmental health and safety personnel working in these settings. One chapter is devoted specifically to unique environmental and occupational concerns in universities. It is important to remember that there are commonalities among all types of institutions. All institutions must provide a safe and healthful environmental for workers and those served by the institution. Most chapters focus on hospitals; nevertheless, all chapters address issues of particular importance for university environmental health and safety staff. For example, all universities provide health care and must have programs in place that prevent injuries, illnesses, or environmental harm. The book is not intended to provide comprehensive coverage of all hazards one may face in an institution. Rather, the approach is to highlight the most significant threats and provide a basic framework that could be applied to analyze and control any hazard. The reason for taking this approach is that, in this rapidly evolving field, newly emerging hazards will continue to appear; however, the same basic strategies necessary to control hazards can be applied to these emerging ones.

While this is not a “how to” book, it will provide useful tools for the professional. Two of the main approaches to problem solving that will be applied throughout the book are the basic tenets of industrial hygiene (IH) and Haddon’s Matrix. The basic tenets of industrial hygiene (anticipate, recognize, evaluate, and control) can be applied to each of the major environmental health and safety program areas within an institutional setting. See “Appendix: Institutional Environmental Health and Safety Matrix,” which was developed by two of the authors and a group of institutional environmental health specialists with the Indian Health Service in the 1980s. The matrix was intended to describe some examples of environmental health and safety tasks in a comprehensive program. Haddon’s Matrix was originally developed as a means of improving traffic safety. It provides a systematic way of sorting through solutions that may be implemented before the adverse event occurs, during the event, or after the event has occurred. The controls can also target people, equipment or supplies, and the physical or psychological environment. The point of the matrix is to determine which control will be most appropriate for a given situation.

In summary, the goal of this book is not to simply identify hazards, but to identify the most effective prevention and control strategies to protect workers and others while in an institution.

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