INTRODUCTION TO BIOMEDICAL INSTRUMENTATION

The Technology of Patient Care

This book is designed to introduce the reader to the fundamental information necessary for work in the clinical setting, supporting the technology used in patient care. Beginning biomedical equipment technologists can use this book to obtain a working vocabulary and elementary knowledge of the industry. Content is presented through the inclusion of a wide variety of medical instrumentation, with an emphasis on generic devices and classifications; individual manufacturers are explained only when the market is dominated by a particular unit. This book is designed for the reader with a fundamental understanding of anatomy, physiology, and medical terminology appropriate for their role in the health care field and assumes the reader’s understanding of electronic concepts, including voltage, current, resistance, impedance, analog and digital signals, and sensors. The material covered in this book will assist the reader in the development of his or her role as a knowledgeable and effective member of the patient care team.

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Preface

This book serves readers who would like to explore medical equipment that is used in the clinical setting. It offers an overview of the fundamental information necessary for work in the field. The material is designed to provide a working vocabulary and elementary knowledge of the medical equipment involved in the treatment of patients. Readers are encouraged to become knowledgeable and effective members of the patient care team, building on the information in this book as a foundation for further study.

Readers should have a fundamental understanding of anatomy, physiology, and medical terminology appropriate for their role in the health care field. Readers are assumed to have a fundamental knowledge of basic electronics concepts including voltage, current, resistance, impedance, analog and digital signals, and sensors. Readers without this background may have to explore terms and concepts referenced in the text.

There is a vital connection between technology and the care of patients. In many cases, health care workers depend on technology to administer care or treatment or to make a diagnosis. This book helps readers understand how technology is tightly woven into patient care. The role of technical support for the medical team is, therefore, essential in the delivery of effective medical care.
The section of each chapter entitled “For Further Exploration” encourages readers to use the Internet to obtain in-depth information about a topic. Questions are designed to push the reader to integrate concepts using external sources. Answers are not specifically available within the chapters. While Wikipedia (http://www.wikipedia.com) may not be an academically authoritative source, it is often an excellent starting point for research. Research exercises encourage one of the most important skills of a successful biomedical equipment technician (BMET) – investigation of topics that are not well understood. In the clinical setting, it is impossible to be an expert about all technology and aspects of patient care. The ability to effectively search for information is vital.

All photographs (unless otherwise noted) are by Valerie Shiver.

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Those who support the technology used in patient care are a dedicated and selfless part of the workforce. They are part of the medical team and have excellent technical skills. Most importantly, BMETs work closely with staff to ensure safe and effective patient care. May this book be the beginning of a transformation that increases career awareness, improves enrollment in training programs, and expands the recognition BMETs deserve.
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