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FOURTH
EDITION



MEDICAL AND DENTAL SPACE PLANNING

A COMPREHENSIVE GUIDE TO DESIGN, EQUIPMENT, AND CLINICAL PROCEDURES

WILEY

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SPACE PLANNING

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A Comprehensive Guide to Design, Equipment,
and Clinical Procedures

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Jain Malkin

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In memoriam to Stuart,
for the many years of enduring patience
and encouragement as I researched
and wrote numerous books,
each time saying it would be the last

And in memory of my Mother,
whose energy and drive, love for the written word,
and intellectual curiosity have shaped my life

Finally, my affection to Gary, whose sense of humor
and commitment kept me going through
this huge endeavor (*that will absolutely be my last book!*)

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Preface

In 1970, I decided to specialize in healthcare design. I spent many weeks at the library researching literature on medical and dental space planning, color and its effect on patients, and the psychological aspects of illness—how do patients and visitors react to hospitals? Why do people fear a visit to the doctor or dentist? What role does lighting play in patient rooms?

Much to my surprise, very little had been written on these topics. I found nothing in architecture or design publications but did come across an occasional article in obscure publications sometimes dating from the 1940s. There were a few articles in the *American Journal of Occupational Therapy* on the effect of the environment on the patient, and there were numerous articles on color preferences of various ethnic groups or cultural taboos with respect to color. A handful of articles on limited aspects of office space planning were scattered in medical or dental practice management magazines and Department of Health, Education, and Welfare publications. Here was a field with few resources and vast potential.

Most medical and dental offices in 1970 were either colorless and clinical or drab and dreary. There was no middle ground. Clinical offices had high levels of illumination, easy-to-clean shiny surfaces, and many medical or dental instruments in view. At the other end of the spectrum were offices designed to be less threatening with brown or beige shag carpet, residential pendant lights, nubby, earth-tone upholstery fabric to conceal soil, and poorly styled wood furniture that appeared to have been rescued from a Salvation Army truck. Dusty plants in macrame hangers often accessorized these unhygienic environments.

I concluded that I would have to do my own empirical research to gather enough data on which to base

my design work. I spent the better part of a year visiting hospitals, interviewing staff and patients, and observing how patients were handled. I wanted to see the facility through the patients' eyes. I also visited many physicians and dentists and asked about their practices—what kinds of instruments they used, what size treatment room would be optimal, what kinds of changes would make their offices more efficient, and what critical adjacencies existed between rooms or treatment areas.

I documented my visits with photographs of confusing signage, waiting rooms furnished with Goodwill castoffs, dismal lighting, corridors jammed with medical equipment, and procedure rooms that resembled Dr. Jekyll's laboratory. At the end of my research, I had accumulated over 2,000 photos and reams of notes that I analyzed. From this, I formulated my design philosophy. My dual college majors, Psychology and Environmental Design, provided a theoretical background with which to interpret my findings. The culmination of my 40 years of experience designing hundreds of medical and dental offices has resulted in this book.

A person with no prior experience in healthcare design can study this book and become familiar not only with current economic and practice management issues, but also with medical and dental procedures, equipment associated with each medical or dental specialty, room sizes, traffic flow, construction methods, codes, interior finishes, and more. I have attempted to summarize my research and experience so that others will not have to follow such a laborious course of study in order to become proficient in a field that requires such highly specialized knowledge.

Today, probably more than a thousand architects and designers across the country list healthcare as one of their specialties. In its infancy when I started out, the field

has now reached maturity. No longer concerned with discovering the basic rules and principles, healthcare design specialists can devote themselves to innovation and refining what has been learned.

The first edition of this book was published in 1982 and featured exclusively my own work. However, the second (1990), third (2002), and the new fourth edition (2014) in order to give a broader perspective, include examples of work by other practitioners who are credited under each photo. I thank each of these architects, designers, and photographers for sharing their work.

The fourth edition updates the book on digital technology—electronic medical records, digital imaging, diagnostic instruments, and networked communications—and how these impact the design of medical and dental offices. The rise of mHealth (mobile monitoring and diagnostic devices) enables patients to be monitored in their homes and this has resulted in a frenzy of partnerships between software providers, device manufacturers, and companies that provide secure portals and networks for transmitting the data. Increasingly, people will be wearing unobtrusive sensors and small monitoring devices, some of which may be managed through applications on their cell phones to measure blood sugar levels, blood pressure, heart arrhythmias, and even to warn them two weeks ahead of an impending heart attack.

The milieu in which physicians and dentists practice—the impact of the Affordable Care Act (ACA), Patient-Centered Medical Homes, the baby boomer generation, the large number of uninsured Americans—is presented as a backdrop for understanding the pressures on the healthcare system, and also, implications for facility design. The influence of the ACA on clinic design, especially in primary care, can be seen in team collaboration spaces and larger examination rooms that enable multidisciplinary coordination of care. In primary care, especially internal medicine, the rise of “talking rooms” reflects recognition that patients often need not disrobe and may, in fact, feel less threatened and more comfortable in a setting devoid of medical instrumentation.

A very thorough discussion of the design of endoscopy centers is presented in this edition of the book. This

includes a literature review of the risks associated with this rapidly expanding service line related to improper or inadequate cleaning of fiber-optic scopes. As I became aware of the risks, I felt compelled to learn more because people who undergo these procedures are generally unaware of the questions to ask and they (like I, before stumbling upon this research), have no idea how really difficult it is to properly clean a scope. Nor are most of us aware of the serious consequences of inadequately cleaned scopes. Because this is difficult work requiring good technique, the design of the workroom and proper lighting really help or handicap technicians in doing the job well. A functional guide to the design of the scope workroom is something that does not seem to exist. As a result of many interviews and site visits, I am glad to be able to provide this information.

A new chapter on Community Health Centers has been added, and the chapter on Primary Care has been expanded to include corporate health and wellness centers, the concept of direct care, urgent care, and integrative medicine. The patient-centered medical home is explored in-depth. Bariatric surgery has been added to the chapter on Medical Specialties. The chapter on Ambulatory Surgery Centers (ASCs) gives clarity to the interplay of licensing, Certificates of Need, accreditation, and Medicare certification. Whether an experienced practitioner or new to planning ASCs, the wealth of information contained in this chapter will enhance your understanding of economic and regulatory issues, code compliance, patient flow, infection control, and more.

Nowhere have changes in technology been more apparent than in dentistry and diagnostic imaging. These and most other chapters have been totally rewritten. Nearly 100 new or revised space plans, revised space programs for all specialties, and new photos of facilities and equipment have been added to all chapters. New developments in medical and dental treatment are presented along with state-of-the-art equipment. Fabrics and interior finishes representative of recent technological advances are introduced, and an in-depth discussion of LEED has been added to Chapter 13, Construction Methods and Building Systems. The updated lighting chapter acquaints readers

with new types of lamps and fixtures with a large section on LED lighting and innovative solutions to enhance both aesthetics and function.

A change since the last edition of this book is the rigor of regulatory agency review of office-based surgery practices, far more stringent mandatory regulation (certification, licensing, and accreditation) of ambulatory surgical centers, and interest by group practices and large managed-care organizations in seeking voluntary accreditation from one or more national organizations as well as Medicare certification. Ambulatory care enterprises such as breast care centers, urgent care, women's centers, or radiation therapy that may physically be located in a medical office building but are covered under the hospital's license, are subject to a Joint Commission survey and accreditation. This book will help clarify

the roles of these various agencies and organizations, explain which aspects of the regulations apply to the built environment, and answer many questions that often arise when trying to understand compliance. I have also tried to clarify OSHA issues that affect design, which required wading through several inches of "interpretive letters" to find those kernels that impacted safety of personnel and were within the province of design professionals as opposed to policies and procedures followed by staff to protect themselves.

On a final note, although the book attempts to familiarize readers with basic code information, codes vary geographically and it is the responsibility of the architect or designer to check local and state codes, as well as the evolution of the Americans with Disabilities Act (ADA) legislation.

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