
Imaging and Visualization in the Modern Operating Room

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A Comprehensive Guide
for Physicians

 Springer

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Preface

White Light and Beyond

The evolution of advanced procedure rooms in the last two decades has been remarkable. The advanced technology operating room (OR), the image-guided interventional radiology (IR) suites, and the hybrid rooms with duo capability are springing up not only in academic centers, but also in disease-specific clinical sites, and high-volume private-practice sites. As simultaneous multi-team procedures for complex disease, minimally invasive surgery, and multi-imaging guidance continue to proliferate, the need for complex lighting solutions grows.

Along with advanced procedure technology, non-white light imaging has also matured to become a usable and useful modality in the modern procedure/operating room. Optical imaging using near-infrared or fluorescent imaging now allows real-time biologic imaging exploiting cellular biology to enhance contrast between normal tissues and pathology. Biologic optical imaging now also highlights locations of essential structures such as nerves and vessels to avoid procedure-related injury. These contrast and biologic labeling agents hold the promise of precisely guiding resection of cancers, drainage of infections, and relief of luminal obstruction of anatomic conduits while avoiding damage of nearby essential structures.

This book aims to summarize the birth and current status of this exciting applied field. Our work is divided into two sections. We first start with a “basis of practice” section discussing the most important advances, the potential of various novel imaging modalities, and the current status. The book then presents a “current clinical practice” section summarizing the current status of approved and near-approval modalities.

The authorship of this work includes many of the luminary and most innovative investigators in this field. We thank them for their contributions and this most wonderful collaboration. This work is intended for anyone working in a modern interventional or operating room. In particular, we are targeting those who may be asked to evaluate new technology for hospitals and clinics or may be asked to help design and implement the next generation of operating/intervention/hybrid rooms.

The quick progress of procedural imaging and visualization in the last years is due not only to scientists, engineers, and clinicians, but also due to patients who have enrolled in the necessary trials. We therefore thank the patients who have contributed to the advances, and whose diseases are the targets that push us to create new solutions.

Gratitude also goes to our postdocs, research fellows, and colleagues who helped us gather data, refine our hypothesis, and design the next tools, and our editor at Springer Daniel Dominguez. Finally, we thank our families and particularly our spouses Nicole, Mikel, Paola, Salome, and Virginia for the patience and support they have given us to do our daily investigative and clinical work, and then to complete a work such as this.

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