

# CURRENT CLINICAL UROLOGY

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Pat F. Fulgham • Bruce R. Gilbert  
Editors

# Practical Urological Ultrasound

 Humana Press

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*To Martin I. Resnick, MD (1943–2007) whose innovation  
and leadership are an enduring inspiration.*



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## Foreword

Hark! Sound belongs to the masses! Similarly, ultrasound is not the private domain of the designated “imagers” in medicine but belongs to all members of the healing arts to the extent they wish to learn and employ it. Sound is the great equalizer providing a measure of social equality within medicine that unlike its royal sisters of imaging (i.e., fluoroscopic, computed tomographic, or magnetic resonance) is available equally and inexpensively (portable units are now <\$50,000) to all.

As with endoscopy, urologists have the opportunity to be leaders in this field, and within the chapters of this book are the tickets for admission. Within these 14 chapters, all aspects of ultrasonographic urology are addressed. Drs. Pat Fulgham and Bruce Gilbert have graced us with a “labor of love,” three years in the making; such is their belief, which I share, that ultrasound is the future of urology and needs to be accepted as an essential part of the urologist’s training and practice. This is “opportunity come knocking”.

The organs of our specialty are largely hidden from “view”—ultrasound makes them all visible, unclanking the future and empowering physicians to favorably alter time’s course on behalf of each patient. Will more renal, testicular, and possibly bladder tumors be “discovered?” Absolutely. Will their early discovery and treatment lead to a state much like we have seen with PSA and prostate cancer, in which the incidence of metastatic disease dramatically decreases and the longevity curve for each cancer is turned “upward?” Only carefully done studies will tell, but already this technology is proving its worth as now follow-up studies for renal stones can be done with the ultrasound unit in the office, thereby saving the patient the time, money, and X-ray exposure of numerous “low-dose” CT scans.

I urge each urologic surgeon to embrace this technology in the fullest sense of its potential, for it is the ticket to a new realm of medicine, one in which we predict and thus prevent the disease before it occurs, proactively diagnose an impending illness prior to the development of debilitating symptoms, and treat/cure a malady in the most minimalist fashion, for the earlier

the diagnosis, the less the cost in dollars and human suffering for the cure.  
With apologies, here be at long last a non-Macbethian future in which:

Life's defined in a passing shadow, a skilled imager  
Who scans and sets this 10 minutes upon the stage.  
And then recorded evermore.  
It is a tale.  
Told by a transducer, full of sound—not fury,  
Signifying everything.

August 9, 2012

Ralph V. Clayman



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## Preface

The genesis of this book was the conflicted conviction that ultrasound has a critical role to play in the management of urologic patients but that it would never be considered an integral part of the specialty of urology until there was a body of scholarly literature on the subject generated by urologists.

Urologists had been performing and interpreting transrectal ultrasound of the prostate for many years and routinely interpreting ultrasound examinations of the kidneys, bladder, and male genitalia, but comparatively few urologists were both performing and interpreting all of these studies on their patients. Therefore, the necessary preamble to this work was the identification of a group of urologists who were clinical experts in all aspects of urologic ultrasound. This group, the American Urological Association's (AUA) National Urologic Ultrasound Faculty, founded in 2007, began the ambitious project of educating themselves about the fundamentals of ultrasound physics, the biologic effects of ultrasound, patient safety, and scanning technique.

A standard curriculum was developed to transmit this enhanced information about ultrasound to practicing urologists, many of whom had already been performing transrectal ultrasound for two decades. The American Urological Association Office of Education has offered this curriculum, including hands-on training, to thousands of urologists in the United States and around the world.

The anticipated and hoped for consequence of clinicians acquiring a thorough understanding of ultrasound technology and technique was the rapid extension of ultrasound to new applications and clinical procedures. This has come to pass. As a consequence, there has been a heightened interest in establishing accepted indications for imaging procedures and guidelines for performing high-quality studies. With the guidance of the AUA, the American Institute of Ultrasound of Medicine (AIUM) has established *Practice Guidelines for the Performance of Ultrasound in the Practice of Urology*<sup>™</sup> published in 2012. The AIUM now offers, for the first time, practice accreditation for urologic ultrasound.

Urologists have now begun to publish original research on the basic science of ultrasound as well as many clinical studies. Ultrasound education has become a more formal component of residency training in urology.

With these foundational pieces in place, we felt it was time to bring the information together in a single work conceived and written exclusively by clinical urologists. As such, we hope the information will be both authoritative and practical.

Dallas, TX, USA

Pat F. Fulgham, MD, FACS

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## Preface

Imaging in medicine has been, and will likely remain, the primary modality for identification of altered structure due to disease processes. As a noninvasive, safe, and relatively inexpensive imaging modality, ultrasound has been embraced by many medical specialties as the “go to” technology.

With ever-changing technology and regulatory requirements, this book was envisaged to provide a compendium of information for the practicing urologist, beginning with the physical science of ultrasound and continuing through clinical applications in urology. It is our hope that this will be the first of many literary endeavors of urologists for urologists interested in performing and interpreting urologic ultrasound studies.

Ultrasound has often been referred to as the urologist’s stethoscope because much of the genitourinary system is not easily evaluated by physical examination and requires imaging for diagnosis. Therein lies one of the unique aspects of ultrasound studies performed and interpreted by urologists. The mandate to examine the patient coupled with the urologist’s experience in both surgical and medical treatment engenders an unparalleled ability to meld the healer’s art with advanced imaging technology. It is our fervent hope that this text might encourage more urologists to embrace the art and science of ultrasound in their mission to provide excellence in patient care.

New Hyde Park, NY, USA

Bruce R. Gilbert, MD, PhD, FACS



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## Acknowledgements

Pat F. Fulgham MD, FACS

This book would not have been possible without the dedication and expertise of our contributing authors, many of whom are leading the way in research and developing new applications in urologic ultrasound.

Dr. Claus Roerhborn brought the practice of office-based ultrasound with him from Germany in 1983. Dr. Marty Resnick enlisted Claus to help educate a generation of urologists. They developed the early AUA Office of Education courses on urologic ultrasound which became the basis for much of the material in this book.

Special thanks to Dr. Bruce Gilbert whose knowledge and patience were the perfect modulating qualities for helping bind the complex pieces together into a cohesive “whole.” His passion for teaching is infectious.

Angela Clark provided invaluable assistance in manuscript preparation, image preparation and labeling, graphics production, and research. Her talented project management, including dogged pursuit of the “finished product,” has been the glue holding the project together.

Finally, thanks to my family whose forbearance permitted me the many distracted hours of writing and editing necessary to complete what proved to be a multiyear journey. It was a “task” in one sense but also a joy to see urologists take ownership of ultrasound as an invaluable tool in the management of their patients.

Bruce R. Gilbert MD, PhD, FACS

This book was the vision of my coeditor, colleague, and friend Dr. Pat Fulgham. Through his leadership over this past decade, he has helped elevate the art of urologic ultrasound to a subspecialty within urology. He is a gifted surgeon, articulate spokesman, and tireless academician who accepts nothing less than perfection from himself, which is contagious amongst all who have had the great fortune to work with him.

To the authors of this book, I am indebted. They have tirelessly given of their precious time away from family and their busy clinical practices to share their experience. Their teachings as expressed in this text form the basis of urologic ultrasound.

My wife, and best friend Betsy, has been the most supportive and loving partner through the late nights and endless weekends involved in this project. She is, and has always been, my source of inspiration.



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