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# Introduction

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The human prostate, located at the center of the male pelvic floor, is much like the crossroads for the male genitourinary system as it can impact both fertility and urinary function. Indeed, the prostate holds significant health implications for a host of benign and malignant conditions. It is implicated in the pathophysiology of a range of conditions, from incontinence to cancer, that are estimated to cost the US health care system tens of millions of dollars each year.

This book has been written for the ultrasonographer, radiologist, and urologist. The book is divided into a basic theory section, an advanced imaging section, and a future of prostate ultrasound section. All three sections are germane to the practice of urology and the treatment of prostatic conditions. The scope of the book encompasses the physics of ultrasound, the technical aspects on the use of ultrasound, the actual present-day state of the art use of ultrasound in the treatment and diagnosis of men with prostatic issues, and its potential future applications.

While there are many texts on ultrasound and many more on prostatic conditions, unfortunately progress in ultrasound imaging of the prostate has effectively stalled. Although our images are sharper, the information conveyed remains a constant. We

are only able to effectively visualize and measure the gland, we are not able to detect prostate cancer and we are only starting to be able to leverage ultrasound techniques to evaluate the dynamic role of the prostate in malignant and benign disease entities.

This book addresses the most up-to-date imaging techniques that incorporate ultrasound in the evaluation of prostate cancer. One of the most important aspects of the book is the focus on the applied physics of ultrasound and future techniques that promise to soon be routinely available as we continue to improve our ability to evaluate this optically illusive disease.

The prostate holds a particularly important place in benign conditions that in terms of real health care expenses are significantly larger than prostate cancer. Situated at the base of bladder just above the pelvic floor, with functional sphincters on either side, the prostate is implicated and often treated in men with significant urinary symptoms related to benign growth and infectious and inflammatory conditions. This book evaluates the imaging of the prostate for the diagnosis and treatment of these benign conditions and capitalizes on the skills of researchers in field to evaluate the future of pelvic floor ultrasound in the male.

It is my hope that this book will provide a framework for moving forward in our thoughts and endeavors to accurately image prostate cancer and to capture the dynamic role of the prostate in benign conditions. The exploration of the science of prostate ultrasound will ultimately facilitate improvements in the care available to our patients.

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