BASIC PHYSICS AND TECHNOLOGY OF MEDICAL DIAGNOSTIC ULTRASOUND

In memory of my late father
and in honour of my dear mother

BASIC PHYSICS AND TECHNOLOGY OF MEDICAL DIAGNOSTIC ULTRASOUND

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Preface

The applications of medical diagnostic ultrasound grow year by year. New diagnoses are described in the literature and novel instruments are developed and marketed.

For the clinicians involved and for their clinical/technical assistants, a knowledge of (a) the basic concepts of ultrasound physics, (b) the interactions possible between ultrasound and tissues and (c) the range of technologies actually harnessed in ultrasound instruments, is of central importance.

These practitioners of diagnostic ultrasound, in radiology, obstetrics, cardiology, neurology, ophthalmology and various other medical disciplines, all need a systematic exposition of these ideas, well-rooted in their background knowledge of physics and physiology but transcending the level provided in manufacturers' manuals for instruments.

The aim of this book is to provide this framework and this groundwork. An elementary acquaintance with general physics is assumed. Only a minimal knowledge of mathematics is required. A clinical involvement with diagnostic ultrasound is, however, fundamental.

After studying this book, the ultrasound practitioner should be much better able to understand the various clinical instruments and the practical methods for using them. More thorough and more fruitful diagnoses of diseases should result.

But other advantages should also emerge: better informed choices of new instruments; more rounded and critical evaluation of new technologies; and more efficient expenditure of limited health-care resources.

Furthermore after studying this book, the student should be capable of delving into the clinical ultrasound literature, both books and periodicals, and should be able to develop his/her career as the field of diagnostic ultrasound evolves.

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M.H.

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