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- Preface** xi
 Arun D. Singh, Brandy C. Hayden, and Charles J. Pavlin
- Ophthalmic Ultrasonography: Theoretic and Practical Considerations** 179
 Brandy C. Hayden, Linda Kelley, and Arun D. Singh
- Ophthalmic ultrasonography is the main diagnostic imaging modality of the eye. It is a safe, noninvasive diagnostic tool that provides instant feedback for the evaluation of various ophthalmic disorders. Diagnostic ophthalmic ultrasonography is most useful in the presence of opaque ocular media caused by corneal opacities, anterior chamber opacities, cataracts, vitreous hemorrhage, or inflammatory opacities. Ophthalmic ultrasonography is also valuable in the presence of clear media and for evaluation of the iris, lens, ciliary body, and orbital structures. This article provides a brief overview of the basic physics of ultrasound, instrumentation, and special examination techniques used in ophthalmic ultrasonography.
- Ultrasound Biomicroscopy** 185
 Charles J. Pavlin, E. Rand Simpson, and F. Stuart Foster
- The authors applied the term ultrasound biomicroscopy to the technique of using high frequency ultrasound to image living tissue at microscopic resolution. A broad clinical experience in normal patients and ocular disease has been gained over the years since its development. This article summarizes the theoretic basis for this technology and illustrates the clinical application of this tool in clinical ophthalmology and ophthalmic research.
- Ophthalmic Biometry** 195
 Karolinne Maia Rocha and Ronald R. Krueger
- Cataract surgery and intraocular lens (IOL) implantation are currently evolving into a refractive procedure. The precision of biometry is crucial for meeting expectations of patients undergoing cataract surgery. Moreover, the optimal results for new IOLs being developed, such as toric, multifocal, accommodative, and aspheric, all depend on the accuracy of biometry measurements.
- Anterior Segment Disorders** 201
 Martin Heur and Bennie H. Jeng
- Because of its high resolution, ultrasound biomicroscopy (UBM) is becoming the preferred modality for evaluating anterior segment structures when direct

visualization is not possible. This article reviews UBM evaluation of the cornea, of intraocular lenses, and in the setting of anterior segment trauma.

Glaucoma

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Edward J. Rockwood, Sumit Sharma, Brandy C. Hayden, and Arun D. Singh

Ultrasonic A-scan, B-scan, and ultrasound biomicroscopic imaging can assist the clinician in the diagnosis and management of patients who have glaucoma. A-scan ultrasonography is used most frequently to determine ocular axial length for purposes of intraocular lens implant calculation. B-scan ultrasonography can be used to map the location and extent of staphyloma formation to avoid accidental trauma to the globe during retrobulbar anesthetic administration and is valuable in the management of the patient who has glaucoma when there is little or no visualization of the posterior segment. Ultrasound biomicroscopic imaging is ideal for assessing anterior chamber angle anatomy and anterior segment abnormalities.

Vitreoretinal Disorders

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Sumit Sharma, Alexandre A.C.M. Ventura, and Nadia Waheed

Vitreoretinal diseases are the most common indication for ultrasonographic imaging of the posterior segment. Using ultrasound, it is possible to identify, evaluate, and follow numerous posterior segment conditions such as retinal tears, vitreous and retinal detachments, retinoschisis, retinal pigment epithelium detachment, subretinal hemorrhage, and eccentric disciform lesions. It is imperative to conduct a thorough examination of all the quadrants to avoid missing any pathology, and to evaluate the vitreous body, posterior hyaloid, subvitreal space, retina, choroid, sclera, optic disc, and macular region.

Intraocular Tumors

229

Evelyn X. Fu and Arun D. Singh

Ultrasonography is a powerful noninvasive tool for the accurate diagnosis and effective management of intraocular tumors. Distinguishing ultrasonographic characteristics of intraocular tumors result from their different histopathologic compositions that can be evaluated with one-dimensional reflectivity analysis (A-scan) and two-dimensional acoustic section (B-scan). Information regarding location, shape, and acoustic characteristics is considered together to aid the diagnosis of intraocular tumors. Determination of size progression and extension is critical in selecting and monitoring management.

Ocular Inflammatory Diseases

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Alexandre A.C.M. Ventura, Brandy C. Hayden, Mehran Taban, and Careen Y. Lowder

Because of its ability to evaluate eyes using either clear or opaque media, ultrasonography has been a critical adjunct in ophthalmology for more than 50 years. This article provides an overview of the ultrasound characteristics observed in a variety of ocular inflammatory diseases.

Optic Nerve Disorders	257
Lisa D. Lystad, Brandy C. Hayden, and Arun D. Singh	
<p>Diseases of the optic nerve are difficult to assess, as tissue diagnosis is usually unavailable. Therefore, various subjective functional tests are relied upon to achieve a differential diagnosis. This article reviews clinical scenarios wherein ultrasonographic imaging provides a readily accessible and inexpensive means for diagnosing and monitoring optic nerve disorders.</p>	
Posterior Segment Trauma	267
Hajir Dadgostar, Brandy C. Hayden, and Alexandre A.C.M. Ventura	
<p>Ocular trauma is a major cause of vision loss, particularly among younger patient populations. This article describes the clinical and ultrasonographic features of several commonly encountered trauma-associated diagnoses that involve the posterior segment in which ocular ultrasound can provide useful information.</p>	
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